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VIENNA UNIVERSAL EXHIBITION, 1873.

A

CLASSIFIED AND DESCRIPTIVE CATALOGUE

OF THE

INDIAN DEPARTMENT.

BY

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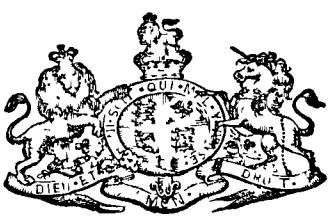
REPORTER ON THE PRODUCTS OF INDIA; CHIEF COMMISSIONER AND DIRECTOR, INDIAN DEPARTMENT, VIENNA EXHIBITION, 1873.



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PREFACE.

In preparing this Catalogue the information forwarded with the collections from India has been, to some extent, supplemented from other sources. The sections referring to vegetable products have been mainly compiled by Dr. M. C. Cooke, and those referring to animal products by Mr. Frederic Moore, and throughout the work there are valuable notices, the sources of which have been duly acknowledged.

As heretofore, the Local Committees established in India have collected from their own districts the special articles of production and manufacture, and it is to the Secretaries of these Committees that this Exhibition is chiefly indebted for the valuable collection which has been forwarded. Unfortunately, the greater part of the consignments did not arrive in Vienna until after the opening of the Exhibition, which was much to be regretted, as it entailed extra expense and labour, and delayed for a considerable time the opening of the Indian Court. This delay materially increased the difficulties connected with the work of the juries, and it is to the indefatigable exertions of my colleagues, Colonel Michael and Captain Campbell Walker, that the Indian Exhibitors are indebted for the large number of awards which have fallen to their share. Upon Lieut. J. R. Royle, until the arrival of Colonel Michael, devolved the preliminary arrangements in the department.

Although the space allotted to India was inadequate to the full display of one or two important collections, the facilities in the way of cases and different appliances provided for the exhibition of the various objects were more liberally supplied on this than on any previous occasion. As regards the collection as a whole, it may be remarked that, notwithstanding some branches of manufacture and some groups of raw produce are inefficiently represented, the present Exhibition compares favourably with its predecessors, whilst there are certain special collections, such as those sent by the Geological Survey of India, arranged under the direction of Dr. Oldham, assisted by Mr. Bruce Foote; the Cotton collection, originally prepared by Mr. Gerald Fitzgerald and Mr. Rivett-Carnac for the London Exhibition of 1872; the Architectural collection by Mr. James Fergusson, the collections of Dr. Leitner, and others, all of which afford important contributions to a knowledge of the productions of India and of her people.

J. FORBES WATSON.

VIENNA UNIVERSAL EXHIBITION, 1873.

INDIAN DEPARTMENT.

Secretaries to Committees in India.

W. S. Halsey, Honorary Secretary, Central Committee.
H. H. Locke, Honorary Secretary, Bengal Committee.
Captain Hurlock Pritchard, Honorary Secretary, Madras Committee.
G. W. Terry, Honorary Secretary, Bombay Committee.
W. A. Ingle, Honorary Secretary, Sind Committee.
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W. Tyrrell, B.A., Honorary Secretary, N.W. Provinces Committee.
Captain J. W. Pilcher, Honorary Secretary, Oudh Committee.
S. J. Dunlop, Honorary Secretary, Berar Committee.
Captain J. Macdougall, Honorary Secretary, Central Provinces Committee.
P. J. Garrett, Honorary Secretary, Mysore Committee.

(The names of the members of the different Committees have not been received.)

Commission appointed by the Secretary of State for India in Council.

Chief Commissioner and Director, Dr. Forbes Watson.

Commissioners, { Colonel Michael, *vice* Baron Dowleans, deceased.
Captain Campbell Walker.

Secretary, Lieut. J. R. Royle.

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"THE PEOPLE OF INDIA."

THIS series consists of 132 Photographs selected from the work entitled "The People of India," prepared at the India Museum, and of which six volumes have now been issued.* The whole series has been divided into two groups. The first group (Nos. 1 to 95) is arranged as far as possible so as to represent all the leading types characteristic of native society in India as a whole, although drawn chiefly from Northern India, or Hindustan Proper. The arrangement of this group follows in some measure the natural stratification of Indian society, beginning with the ruling and proprietary classes, and ending with the gipsies and wandering tribes.

The second group (Nos. 96 to 132) illustrates locally interesting tribes, reputed aborigines of the country, and some of the more interesting frontier tribes. The arrangement of this group is entirely geographical.

A.—THE PRINCIPAL RACES, CLASSES, AND TRIBES OF INDIA.

a.—BRAHMINS.

The Brahmins are divided into two main classes—one, "Loukik," or "secular;" the other, "Vaidik," who follow sacred callings. To these a third class may be added—"Bheekuk," or those whose sole support is begging and the alms of the charitable. These classes are subdivided in every part of India into an infinity of sects, some of which do, and others do not, intermarry with each other. Brahmins may be considered to be divided into ten great nations, five of which belong to Northern, and five to Southern India, but there is little or no connexion between them. The Brahmins of Northern India are held in small repute by those of the South, and vice versâ. In regard to sacred professions, some are literally priests, who perform ceremonies and make offerings for other Brahmins, assisting at household offices, daily prayers, purifications, marriages, and funeral ceremonies. Others are purohits, or family priests or chaplains, not only to rich Brahmin families, but to princes of lower caste—Rajpoots or Sudras. Such offices are for the most part hereditary. Brahmins who have attained a high degree of sanctity and learning are frequently chosen as gurus, or spiritual directors by other Brahmins, and also by lower castes. A very large proportion of Brahmins support themselves and their families by begging, visiting wealthy persons, reading to them from Sanscrit books or more popular treatises, or from dramas, the recitation of which, with episodes from the Mahabharat and Ramayana, are fertile sources of profit. Nor do the lower classes escape. At marriages, at funerals, at naming of children, Brahmins must be consulted, paid, and fed. Nor is any action of social life complete without them. As astrologers, they are in full occupation. Brahmins, except those connected with them as ministering priests, rarely resort to temples for their devotions, and except in fulfilment of a vow, or on public occasions, are seldom seen there. The home service is considered sufficient for all purposes of purification, and if a temple is visited, it is after the ordinary home service has been concluded.

* "The People of India," a series of photographic illustrations of the races and tribes of Hindustan, originally prepared under the authority of the Government of India, and reproduced by order of the Secretary of State for India in Council, with descriptive letterpress by Col. Meadows Taylor, C.S.I., M.R.A.S. Edited by J. Forbes Watson, M.A., M.D., and Sir John William Kaye, K.C.S.I., F.R.S., London: W. H. Allen & Co.

Comparatively few Brahmins, except some of the lower degrees, are actually temple priests; and though they attend temples, and perform ceremonies, read sacred books, and offer oblations on behalf of others, they are rarely Poojaris, or, as they may be termed, temple servants. These are hereditary offices, held by persons of much lower caste, not unfrequently by Soodras. On the other hand, the Loukik, or secular Brahmins, in some instances follow agricultural pursuits; and except actually holding the plough, perform all other work. They are also frequently bankers, money lenders, and money changers, merchants, and the like: but they never descend to the rank of shopkeepers, nor engage in retail trade. They are never artizans or manufacturers. The very lowest orders among them are menial servants to the upper classes, cooks, attendants on temples, and on assemblies where Brahmins are to be feasted, for the purpose of preparing and decorating houses or courts with garlands of leaves and flowers, sweeping and watering the ground, and such like other offices. Many again, especially of the Northern Brahmins, are found in military service.

With the regulations of caste, the enforcement of caste rules and discipline, and the morality or immorality of members of castes, the Brahmins do not interfere. Such matters are the province of the caste gooroo, or instructor, or of its own priests. But the Brahmin's ritual supremacy is absolute: herein he has no competitor, whether in the lowest or the highest castes.

No. 1. Brahmins.

In the present instance a group of four persons is represented. One of these is reading, probably from a sacred book, to a boy who is sitting on his right hand, and is most likely a pupil. The other two men are apparently listening, though the youth on the right of the group may be a scholar also, of a more advanced age than the other.

No. 2. Brahmin.

The figure represented is engaged in his "Pooja," or morning worship, with the objects of his adoration before him. From the horizontal mark on his forehead, which is composed of sandal wood paste, and may be either white or saffron colour, he is evidently a worshipper of Siva, under any of his appellations, Mahadèva, Bhudrinath, &c. He is not clean shaven, which may be accounted for by a vow, by being unable to find a proper conjunction of planets for the operation, or by his observing ceremonies after the death of a near relative. He is enveloped in a light silk or serge shawl or mantle, because woollens or silks do not involve impurity which cotton does. Below he wears a dhoti, which, if cotton, must be damp or wet while the ceremony lasts; or he may wear a waist cloth of thin serge or silk. His "junwa," or sacred thread, passed over his left shoulder, hangs outside his mantle, because it has to be passed through his hands at certain portions of his ritual, in order that it may be preserved pure. His objects of adoration are placed upon a low stool before him, which is covered by a clean cloth. In his immediate front are three small idols, which are probably Siva under three forms, or Siva and his consort, Bhowani Doorga or Kali. The sacred stone Shalgrama lies at the side of the plate, as also the necklace of Rudraksh, which is supposed to be worn by the god. All these, and some other objects which are not clearly discernable, are in a brass thali or platter, which he has scoured till it is as bright as gold. Outside this platter are the bell he rings to apprise the divinity of his service; the conch shell which he blows to invite all gods to partake of it; a small brass vessel containing water and leaves of kusa grass, or the toolsee plant (sweet basil); and an incense burner, from which a stick of fragrant pastile is sending up a grateful perfume, and a cup containing the thin sandal wood paste, used for the idols and himself.

No. 3. Suroosatee Brahmin.

The subject of the photograph belongs to the highest and most sacred division of his order in the Punjab, who themselves form a distinct class from, and do not intermarry with, other Brahminical classes of the Punjab or elsewhere. Their designation is derived from the river Suroosatee, or Suruswutee, which runs through the district of Hastinapoor, near Delhi, the most sacred of Hindoo territory, as the locality in which the Aryan invaders first settled, and afterwards became famous from the contest of the solar and lunar races described in the Mahabharat. They are for the most part good Sanscrit scholars, and are employed as family priests, directors of ceremonials, and expounders of the sacred books. They are also astrologers and astronomers. It is hardly credible how much of the observances of the Hindoos, even of the educated and respectable classes, is dependent upon lucky or unlucky days and hours, as decided by astrologers. Not only do the grave questions of marriage, of journeys, of buying and selling, of serious understandings of all and every kind, depend upon the astrologer's counsel, but the putting on of new clothes, being shaved, having the hair and nails trimmed, paying visits, giving entertainments and the like, as well as reaping or sowing fields, planting trees, commencing buildings, or repairs, must all be decided, as to the most proper and fortunate hours, by the astrologer, and in short, there are no questions of social significance or necessity, which, in most Hindoo families able to pay for them, are not referred for the astrologer's advice and decision, and are decided on the peculiar aspects and conjunctions of the planets.

No. 4. Nait Ram.—Sunat Brahmin.

Nait Ram is forty-four years of age, and five feet six inches in height, of dark complexion, with grey eyes and black hair. He is a follower of Siva or Mahadeo, as may be seen by the horizontal marks on his forehead, and a teeka or circular spot in the centre. This may be of ground sandal wood, or white earth ground up with water. Or it may be red if he worships Kali or Devi, thus combining the adoration of husband and wife. The marks on his breast and arms are also of sandal wood, which he has rubbed upon a stone kept for the purpose until of the consistence of thick cream. Into this he has dipped the ends of the fingers of his right hand, and painted himself in stripes after his usual fashion, inserting large dots in various places, as well for effect, as for the protection of his principal muscles and the vital parts of his body from evil influences. By his beard, the mark across the bridge of his nose, his scanty waist cloth, and rag cast over his head, as well as by his beads and staff, he appears to be a mendicant friar or priest, perhaps upon a pilgrimage. His "janwa," or Brahminical thread, the emblem of his rank as a Brahmin, is worn over his left shoulder, across his chest, and is tucked into his waistband. Nait Ram has apparently just performed his morning's devotions, a part of which is the marking or painting of his body as he chants the usual liturgy of prayer and incantation. Thus he is purified during the day. In the evening he will bathe again, and wash off the paint, to be renewed with the morning devotions to the end of his life.

No. 5. Gunga Sahai.

By his costume, the person represented would appear to be a Loukik, or secular Brahmin, with no great pretentions to sanctity; he may be a secretary or teacher, or an officer in the Civil Service of Government. At the time his portrait was taken he wore a yellow turban, a light green tunic, silk trousers, striped yellow and black, and a red Cashmere shawl with embroidered border.

No. 6. Sook Narain.—Pundit, Brahmin.

Sook Narain belongs to the class of Brahmins called Misser, who are found almost all over India. Sook Narain is a high priest, and performs religious ceremonies for those who require his services.

He is a Vaishnoo, namely, an especial worshipper of that god, and a Bhugut, or one that never touches animal food. He lives on the offerings made to him by the worshippers who attend his ministrations.

No. 7. Pundit Jowalla Nath.

A secular Brahmin, in the service of Government. The Pundit is, or was, tehsildar, or collector of revenue of the Roorkee district. He has mastered the English language, which he both writes and speaks with a fluency and correctness rarely attained by a foreigner; and his honorary title of Pundit is a high standard of proficiency in the Sanscrit literature of his own country, as it cannot be assumed without examination before the elders of local Sanscrit colleges.

No. 8. Jumna dressed as the god Krishna.

Jumna is a native of the Boolundshahur district, about twelve years of age. He is here represented as dressed, during the annual fair at Hurdwar, to represent Kuniya, or Krishna, a Hindoo incarnation of "Vishnu," one of the gods of the Hindoo trinity. He is seated upon a wooden platform on the "Hurka Pairee," or sacred steps leading down to the Ganges, with a brass dish (called a thalie) placed before him, and begs charity from the visitors at the fair. He is by caste a Brahmin. On his head he wears a cap surmounted by a circular fan of peacock's feathers. He is richly dressed in silk, with a heavy gold embroidered shawl cast over him; under him is a cotton carpet, which covers the platform.

Such representations of the most popular divinity among Hindoos are generally personated by fair good-looking boys, ordinarily sons of Brahmins, though not of the highest rank. They are accompanied by adults, who may be relatives, and who chant portions of the Bhugwut Poorân, the Mahabharat, or other works which contain details of the life, acts, and doctrines of Krishna. There are many great temples to Krishna. Muttra his birthplace, Juggunath in Orissa, Dwarka in Guzerat, the seat of his kingdom and the locality of his death, Trippetti in Southern India, and others, are all places of pilgrimage for devout Hindoos; while devotees in his name wander in great numbers through the country in all directions. They may be known by the broad arrow or trident mark on the forehead, seen in the photograph, two sides of which are white, and the centre spot or line red; and which, in the Bairagis and Jogis, form remarkable features of their daily adornment.

No. 9. Unmarried girl.—Thakoor, Brahmin.

The subject of this illustration belongs to a tribe of Brahmins of the Upper Provinces, who are known by the name of Thakoors: a title of respect. She is a good specimen of the women of her tribe, in appearance as well as in costume, which is of modern character. The girl represented is unmarried, as may be seen by the absence of the small bead necklace, which is worn tight round the throat in all cases, both by Hindoos, and also in the present times by Mahomedans, and which is tied on during the marriage ceremony.

No. 10. Man Kour.

Man Kour is a Hindoo widow, of about twenty-five years of age, by caste Brahmin, and a resident of Hurdwar, chiefly living on the charity given her by the visitors. High caste Hindoo women do not remarry, and many of them end their days at Hurdwar, which they consider a specially holy place. It is evident that Man Kour has not given up the world as it was incumbent on her as a Brahmin widow to do, if she followed the strict practices of her people. She has not had her hair shaved off, and she still wears the pote, or bead necklace, round her throat, which was tied there as part of the marriage ceremony, She has earrings, and a gold ornament round her neck, and her clothes are of gay colours. All this is strictly indecorous as a Brahmin widow of any pretension to respectable character; as one she should have divested herself of all ornaments, kept her head shaved, and worn white garments only.

b.—RAJPOOTS.

Rajpoot (Raja Pootra, the sons of princes) is the title claimed by all of the Kshuttri, or second grade of Hindoos, according to the established four great divisions of Brahmin, Kshuttri, Vyse, and Soodra. Of these the Kshuttri are the military class of warriors, and belong to the original stock of the Aryan invaders and conquerors of India.

Rajpoots are divided into many classes and clans, some of which can intermarry; while others, as well from the assumption of exceeding purity of descent, as from degeneracy of mixed extraction, can only marry in their own grades. There is no class of Hindoos in India so fastidious upon the score of unblemished descent as the Rajpoots, and, as a consequence, none more difficult to satisfy in marriage contracts. As an unhappy consequence of these prejudices, female infanticide has been very largely practised among all Rajpoot clans and families of India.

In consequence of the persistent efforts of the India Government, however, it may now be said, that in most localities of the British provinces, the destruction of Rajpoot female children has ceased, that the census return shows a fair proportion of girls to boys, and that the difficulties of marriages have been greatly overcome. In native Rajpoot states, the engagements of chiefs and princes with us, and the system of registering female births which has been introduced, have contributed in a large degree to the success of this measure; and thus thousands of lives have been saved which, under former custom, would have been infallibly sacrificed.

Every Rajpoot is master of his weapons, and most of them perform daily gymnastic exercises, of a difficult and arduous character, to an advanced period of life. They have no objection to agriculture, but, on the contrary, are excellent farmers. They refuse, however, to hold the plough, and only do this office under necessity, and when unable to hire a ploughman. In Oude they form the great hereditary proprietary of the country, and wherever tribes of them have settled, they have acquired land and retained it. In recent times some of them have taken up education, and are now attending schools, filling civil and other situations, for which, from their natural intelligence, hardly less than that of Brahmins, they are eminently capable.

The present tribes of Rajpoots are found for the most part in the independent states of Jyepoor, Oodeypoor, Ajmere, Joudpoor, and in the great area between the Sutlej and Indus to the west, the Ganges and Jumna to the east and north, and the Nerbudda to the south, where they form a large and important portion of the general population. The chief clans are the Chohan or Chowhan, the Rahtore, Hara, Jhareja, and Ratoch. Of these the Chohans are most numerous in Mynpoorie, the Haras in Harowtee, their especial province, the Jharejas in Cutch and Guzerat. In Oude the Rajpoots form the almost exclusive military population, although engaged in agricultural pursuits; and it was from this province that the Bengal army used chiefly to be recruited.

Rajpoots are, in by far the greatest number, vegetarians, subsisting upon farinaceous food, with vegetables, pulses, ghee, butter, and milk. Nor has this affected their strength or endurance. Some of the Rajpoots are decidedly the finest men India produces; many among them being six feet and upwards in height, and stout in proportion, with strikingly handsome features, fair complexions, and grey eyes—the unmistakeable evidence of purity of descent from the ancient Aryans.

No. 11. Maharajah of Benares.

The present Maharajah has shown himself fully alive to the advantages of European civilization; and has displayed much munificence in contributing from his large revenues to the schools and other institutions of the city.

No. 12. Rajah of Jubal.

Jubal is one of the many small territories which are classed under the denomination of Simla Hill States, and yields a revenue of from 8,000*l.* to 10,000*l.* per annum.

In 1852, the present Rajah was a minor; and owing to the maladministration of the property by his father, he was made a ward of Government, and his estate placed under the control of the political agent at Simla, until he attained his majority.

When the mutiny and rebellion of 1857 broke out, the hill chieftains, and those of the Punjab, were called upon by the Chief Commissioner, Sir John Lawrence, to afford their aid in support of British authority; and it was by their prompt and loyal

compliance with his orders, and able co-operation with British forces, that the peace, not only of the Hill States, but of a great portion of the Punjab, was preserved. The most powerful of these princes, the Rajahs of Jheend and Kuppoortala, of Puttiala, Nubha, and Kylore, sent contingents, which did good service in the field, and at Delhi, against the rebels. The remainder, with one exception, the Rajah of Bussahie, afforded the best assistance they were able in their separate localities, by preventing the spread of disaffection or revolt, and the necessity of still further subdividing the disposable British troops. Among these chiefs the young Rajah of Jubal occupied a distinguished place, and thus justified by his loyalty the confidence which had already been reposed in him. On the restoration of peace, and as a reward, a considerable permanent reduction was made in the amount of tribute to Government with which his estate is chargeable.

No. 13. Chuttro Rajah.

The Rajah's connexion with the Rajpoot tribe is believed to be due rather to a succession of marriages than to direct descent.

No. 14. Rajah of Mundi and Ministers.

Mundi, signifying a market-place, is a township situated on the left bank of the Beeas river. The last Rajah died in January, A.D. 1851. His son, Rajah Bijoy Sain, was then a child about three or four years old; and, for the management of the Mundi principality, a regency was appointed, the president being Wuzeer Goosaen, a Khatree by caste, who, from a very humble position, had raised himself by his ability to the office of Prime Minister, another of the members being Meean Bhag Sing, the uncle of the Rajah. In the Photograph all these are represented: Rajah Bijoy Sain in the centre, Meean Bhag Sing on the right of the Rajah, and Wuzeer Goosaen on his left.

The practice of Suttee was formerly carried on to a fearful extent by the Rajahs of Mundi, in common with all the principal Rajpoot families in the Kangra hills. Close to the entrance of the town of Mundi are several monumental stones, bearing representations in relief, not only of the Rajahs of Mundi who have died, but of the women who have perished with them by the rite of Suttee. As one of these stones is set up on the death of each Rajah, there are memorials here of thousands of victims to the cruel rite of Suttee. With the last two Rajahs who died under Sikh rule (Rajahs Toree Sain and Zalim Sain), thirty-five women perished. With one, seventeen; and, with the other, eighteen. Of these thirty-five women, more than half were slave girls. The practice of Suttee was interdicted by the British Government in 1846. At the same time the Rajah of Mundi was called upon to put a stop to the practices of slave dealing, female infanticide, and the burning or drowning of lepers.

No. 15. Seeba Rajah and Suite.

The figure in the Photograph on the Rajah's left is the sheristadar, or ministerial officer of his court; the other is an armed attendant of the Rajpoot caste.

No. 16. Poorun Sing.

Poorun Sing is a Hindoo inhabitant of Godha, district Allyghur, where the tribe to which he belongs has lived for hundreds of years. They are landowners, and support themselves by the proceeds of their property. They sometimes travel on business, and their pursuits and dispositions are now generally peaceful, but they are reckoned a proud and warlike race.

No. 17. Thakoor Heera Sing.

Heera Sing is a Rajpoot Thakoor, or nobleman of the Jadoon caste, residing at Judbunsee. His native place is Somna, in the Allyghur district. He possesses large landed property, which he manages in person.

No. 18. Rajpoot of Bareilly.

This is evidently a person of higher rank, and is most probably a zemindar or landowner.

No. 19. Rajpoot of Bareilly.

The subject of this plate appears to be a substantial farmer, or, perhaps, a banker, by the thin gold chain about his neck. He carries his sword as the invariable appendage of a Rajpoot gentleman, which he never discontinues in public; and his plain suit of cloth, with brocade trousers and a shawl about his waist, form a costume at once simple and elegant.

No. 20. Marwaree Rajpoot.

A Marwaree from Jodhpoor, on the western side of India. Marwarees are to be found in all parts of the country, and are remarkable for their mercantile ability, which in many cases renders them the possessors of great wealth.

No. 21. Rajpoots from Delhi.

The group photographed shows a party of Chohan soldiers, armed in the native manner. The figure on the right has a broad shield at his back, which is slung over his left shoulder, and can be disengaged in a moment. It may be of rhinoceros hide, or of raw bullock or buffalo hide, pounded and cast, as it were, in a mould, which is nearly as strong. The central figure is a matchlock man; the other two, ordinary swordsmen.

Chohan, Chouhan, or Chauhan, is the name of one of the principal Rajpoot races, numerous and powerful branches of whom are found in Oude, as in every part of the North-western provinces of Bengal, as well as in Rajpootana and Malwa.

No. 22. Chohan.

The most distinguished families of the Chohan race are, in Central India, the Khichi, Hara, Bhadauria, Rajkoomar; in the British territories, the Rajor, Pertabnir, Chakarnuggur, and Munchunna, the head of which last is known as the Rajah of Mynpoory; the Munchunna family trace their descent from the celebrated Prithi Rai.

No. 23. Rajkoomars.

Rajkoomar, meaning the son of a prince, is the name given to a numerous and opulent caste in Oude and the North-western Provinces, who, though claiming to be of the military or regal tribe, yet follow agriculture with great success.

No. 24. Bys, or Bais.

The Bais Rajpoots are one of the most ancient Rajpoot families in Oude, in which they give the name of Baiswarra to a large district.

No. 25. Gurgbunsees.

Gurgbunsee is the name of a considerable Rajpoot clan, in the Fyzabad district of Oude, which claims descent from the famous saint Gurg. The Gurgbunsees are a refractory and warlike race, and belie their holy origin by enjoying the now unenviable reputation of being the only Chuttrees of this district who are peculiarly addicted to thieving.

c.—JATS.

The Jâts or Jauts are a tribe of Hindoos widely spread in Central and Western India, and are a bold, independent class of agriculturists, closely connected by clannish ties, who have proved themselves on many occasions to be brave and excellent soldiers. Their largest settlement in Central India is in the territory of Bhurtpoor, the Rajah of which principality is their acknowledged head. Their establishment in this province dates only from the close of the Emperor Aurungzede's reign, when the tribe, having plundered the royal camp, took possession of their present location under their chief Chooramun, who founded Bhurtpoor.

In all official reports they are described as the best agriculturists in Northern India. They plough and clean their fields efficiently; they understand the rotation of crops; and their agricultural implements, if rude in form, are efficient for all purposes. They understand also the qualities of soils, the best methods of developing them, and the application of manures. In short, Jat agriculture possesses a completeness and thorough acquaintance with the science of the pursuit, which form a favourable contrast with that of other classes of local farmers. They are excellent cart drivers; and men not wanted at home, or who possess carts and bullocks, hire themselves for journeys, or even for long periods between the rainy seasons, which they usually pass at home They are the great carriers of the cotton, madder, oil seeds, and other produce of Bundelkund, by which the railways and boats on the Ganges are supplied: and, in return, they bring back salt or British manufactures. In all these transactions they are esteemed perfectly honest, and merchandise is intrusted to them to any extent of value. These cart carriers generally travel in companies, and their hardy drivers not only watch their cart camps at night, but are quite able to defend them against any attacks by robbers, even if any should be attempted. But the character of the Jats preserves them from molestation. They never become artizans in any capacity. Such pursuits are considered low and degrading, and the clannish pride of a Jat is great.

No. 26. Thakoor Tej Sing.

Tej Sing is a Hindoo nobleman of the Jat tribe, and an inhabitant of Pisaweh, district Allyghur, where the family have resided time out of mind. This gentleman, and his brother Shib Sing, are proprietors of a large estate, known as the Talooka of Pisaweh, and they live on the proceeds of their property.

No. 27. Dhokul Sing.

Dhokul Sing is a Jat landholder. He comes from the Goorgaon district, and is forty-two years of age, and of dark complexion, with greyish eyes, five feet ten inches in height.

d.—GOOJURS.

The Goojurs were formerly renowned for their martial habits and character. They have now chiefly adopted agriculture as a pursuit; but are stated to be very indifferent cultivators, and their love for lawless practices, though restrained from being displayed on a large scale, shows itself in a propensity for thieving. In the Meerut district they are especially fond of cattle lifting, and are regarded as the pests of the territory. Semi-military tribes of India, like the Goojurs, though avowedly following

peaceful avocations, are perhaps the most difficult of entire reclamation. They resist the influence of order, and whether formerly under the Mahomedans, or recently under ourselves, have proved themselves impatient of restraint, breaking out into turbulent lawlessness whenever an opportunity occurs. The Goojurs profess, rather than follow Hindooism, are wonderfully hardy, and, as a rule, long lived.

No. 28. Naorung.

Naorung is an inhabitant of Phuppoond, in the Meerut district, and belongs to the Goojur tribe, who form a large proportion of the population of the upper North-western Provinces of India, and claim Rajpoot origin on the male side. Naorung is a fair specimen of his tribe, stout and good looking, but with a hard reckless expression of countenance, and the air and carriage of a soldier. His dress is a tunic, quilted with cotton, as usually worn in the cold weather, and the sword belt of buff leather denotes his semi-military character.

e.—SIKHS.

The Sikh faith had been established in the Punjab during the latter part of the fifteenth century, by Nanuk, a Rajpoot or Kshuttree, who was born in the year 1469. In the year 1675, Govind, the tenth Gooroo, or spiritual leader, in succession to Nanuk, altered the original Sikh faith considerably by abolishing distinctions of caste, admitting all creeds and castes of Hindoos as converts without distinction, and upon terms of perfect equality. At the same time he in so far reverted to the original Hindoo foundation of Sikhism, that he advocated the reverence of Hindoo deities, and of Brahmins. By these means, there is no doubt that he obtained a large accession of followers, and that many of the Jats and Rajpoot tribes joined the now formidable confederacy, who had before wavered. Govind was a man of ardent fanatical zeal and indomitable valour. As crowds of fresh devotees joined the Sikh standard, he made a military profession the pledge of initiation, and recommenced the hereditary feud against the Mahomedans, which probably had never entirely been discontinued.

The military spirit and combined association, which it had been Govind's object to establish, survived his death, and ultimately secured for the Sikhs a national existence and independence, which, as the imperial power of Delhi declined, became more and more formidable.

Descendants of Govind still exist, who are termed Sodhees. They are reverenced as the descendants of the great teacher and military leader, and are supported by the voluntary offerings of the Sikh people at large; but they have neither the office nor the sanctity of an hereditary priesthood, and though supposed to act as teachers, are for the most part an idle class, remarkable chiefly for profitless and dissolute lives.

No. 29. Sikh Jat of the Sindhoo Clan.

The offspring of a Rajpoot father and a Soodra woman have taken the appellation of Jats, and though they do not rank as high in the scale of social caste as the real Jats, yet become connected with them by marriage, and so merge into the general mass of the tribe. In some cases they remain Hindoos, and acknowledge Brahminical doctrines and priestly control; but in others they become Sikhs, and one of the clans of the Punjab, the Sindhoo, is composed of them. The Sindhoo Jats, being Sikhs, do not differ from other Sikhs in any respect. They have been brave and faithful soldiers when required to serve as such; but as Jats they are essentially farmers and cultivators of the soil,—a sturdy, stalwart clan, remarkable, perhaps, in this respect, even among their neighbours. They are not bound by rules of caste in regard to diet, but adhere to the customs of their "gote" or division, especially in regard to marriage alliances and ceremonials, with the general strictness of all Sikhs.

No. 30. Muzbee Sikhs.

Although the Sikhs professedly admit all classes of people to their religious belief and community in general, yet it seems to have been impossible, in the case of the Muzbees, to sink entirely the consideration of their previous low position in the social scale of caste, for they are not recognized as equals in position to Sikhs who may originally have belonged to the higher classes of Hindoo life. They are a faithful and very industrious class, acting as village watchmen and police, and may be well termed the "navvies" of the Punjab, working, as they do, at railways, roads, canals, and the like, with great skill. They are found also in gangs, under their own head men, all through the North of India, and, indeed, as far as Calcutta, working for daily hire, or taking minor contracts under the railway contractors and officers of public works.

The Pioneer Battalions of the Punjab and North-west Provinces are almost exclusively composed of Muzbee Sikhs, and at the siege of Delhi, and in

other operations against the rebel Sepoys in 1857–58, they displayed admirable endurance and valour.

The Muzbee Sikhs, in general, are a powerful athletic body of men, having no trammels of caste, eating animal food habitually, and drinking freely of ardent spirits. Polygamy is not much practised among them, and their women work as hard as their husbands. They have no particular costume or language, both being what is current in their country: the men wear a simple tunic, turban, and loose baggy drawers; the women the petticoat, boddice, and scarf, chiefly of coarse material.

f.—Mahomedans.

The Mahomedans of India are divided into four general classes without distinction by creed; namely, Syud, Sheikh, Moghul, and Pathan. Of these the two first are the most numerous and most ancient, the Syuds claiming to be the descendants of Mahomed, through Fatima his daughter, and the Sheikhs constituting the remainder of those professing Mahomedanism, who formed the great bulk of the people. Pathans as well as Moghuls are Syuds and Sheikhs; but a clannish and exclusive spirit has, in the main, kept them separate. The Moghuls are the descendants of those immigrants into India who followed the Tartar and Toorky invasions and dynasties, and who always constituted large proportions of the Imperial armies; and the Pathans belong to the races of Afghans who, the original Mahomedan invaders of India, founded many dynasties of kings and emperors of Delhi, and gradually formed colonies in many portions of the country. They are settled in great force in Rohilkund, a term derived from Rohilla, an appellation which attaches itself to all Afghans, most particularly to the inhabitants of the passes into Afghanistan, and their neighbours the tribes inhabiting the country to the north-west of the Punjab, who were doubtless the progenitors of those of Rohilkund.

The Pathans or Afghans are found throughout Northern India, and many of them are in the service of native princes. His highness the Nizam, in particular, employs considerable numbers of them in the civil and military departments of his administration. A large colony of Pathans existed at Kurnool, in the Madras Presidency, which was an independent principality up to the year 1838, when the reigning Nawab was convicted of treasonable intrigues and imprisoned. His territory was afterwards annexed to the Presidency of Madras, and his numerous retainers were embodied in a corps of local irregular cavalry, called the Kurnool Horse, which still exists.

The Pathans have not mixed with the ordinary Mahomedan population of India, and have, by marrying exclusively into their own Afghan tribes preserved a peculiar and eminently national character. Many of them are very fair, and have the grey or blue eye of the parent stock, with brown hair. Their women are described to be very handsome, but they are, if possible, more jealously guarded than any other of the Mahomedans.

The Pathans besides being soldiers, are dealers in horses, as well as breeders of them to a great extent. They are also bankers and money-lenders, not objecting, on religious grounds, to taking usurious interest. They are often successful administrators of provinces under native Governments, but in such positions are not unfrequently violent and cruel. Among the tribes are found many dissenters from the orthodox faith: not a few of them are Shiahs, and others believers in the "Ghyr Mehdavee" doctrines, which recognise a further revelation by a prophet who is to appear hereafter.

No. 31. The Imperial Family of Delhi.

For many years the King of Delhi was recognised as the nominal head of Government in India. His name was upon the British, as all other coinage, and the British Governor-General styled himself his servant. On occasions of successions in the native states, the customary offerings were made to the king, who, in return, sent dresses of honour and letters of congratulation and confirmation; while, to the last, the farce of pretending to seek distinction and titles from the king, was kept up by the rulers of states who had shaken off all allegiance to Delhi, and in the days of its great misfortunes had carefully avoided all connexion with, or assistance to it. This, indeed, might have been considered a harmless exercise of royal privilege, which could not, under existing circumstances, be interfered with; but, as it subsequently transpired, the palace of Delhi became the focus of all the deep-lying discontents of the Mahomedans of India, and when the native portion of the Bengal army broke out into actual mutiny, and, as far as possible, rallied round the king, there seemed

to arise a well-founded hope of a renewal of actual sovereignty. But it existed for a very brief period only; and for the outrages committed under his personal knowledge, if not actual direction, the king, after his apprehension, was tried by a commission and found guilty. His life, for many reasons, was spared; but he was sent into exile, and died at a very advanced age, at Tounghoo, an obscure town of British Burmah.

No. 32. Pathans.—Oude.

No. 33. Ushruf Ali Khan—Pathan.

He has light brown eyes, black hair, very sallow complexion, dressed in a rich blue satin coat, with silver spangles, blue Cashmere shawl, brown turban, and yellow Paejamahs; height five feet nine inches.

The family of Ushruf Ali Khan comes from Afghanistan, but has resided in Allahabad for upwards of a century.

No. 34. Pathans.

No. 35. Pathans of Bareilly.

No. 36. Meer Inayut Hosein.

Meer Inayut Hosein, a Syud Mahomedan, as his name indicates, is an inhabitant of Jellalee, in the Allyghur district, where the family have lived for many generations. Syuds are of three clans, known as Hussnee, Hosseinee, and Hussun-ool-Hosseinee. All are descendants of Fatimah, daughter of Mahomed. The first two are the offspring of her sons Hussun and Hossein—the last, that of her daughter Hosseinee. Syuds are very numerous throughout India, the tribe being continually increased from the circumstance that persons of the Sheikh tribe, born of a Syud mother, also became Syuds. The tribe is supposed to have come to India, not, as might be surmised, direct from Arabia, but through Bokhara and Afghanistan; first with the army sent by the Caliph Omar, next with Mahmood of Ghuzni, and afterwards with Timour.

Syuds are proud of their supposed descent, and wear a green turban in token thereof. They intermarry with no other sect except Sheikhs, and look on all unclean animals with especial hatred. They are mostly Shiahs, or believers in the calling of Ali, Mahomed's son-in-law, as his successor. They discourage the jehad, or extermination of infidels, and eat all animals except the pig, provided that they have been lawfully killed—that is, that the throat has been cut by a Mahomedan after a certain form.

No. 37. Syuds.

No. 38. Shair Ali Syud

Is an inhabitant of Gungeeree, in the Allyghur district, but of Persian origin. Gungeeree has been the residence of the family for upwards of four hundred years, ever since they left Timriz, in Persia.

No. 39. Syud Meer Khan; Sirdar Bahadoor.

Meer Khan, member of a family expatriated from Cabool for their fidelity to us in 1840–42.

No. 40. Shah Abdoollah Subz posh.

Shah Abdoollah is the head of a family which came from Medina in Arabia to India during the reign of Secunder Lodi, Emperor of Delhi, and has resided in Goruckpore for several centuries. The title Subz posh (Subz green, posh dress) taken from the dress is the distinctive mark of nobility, and is peculiar to all Syuds who are employed as priests, other classes wearing a green turban only.

No. 41. Chishtees.

The Chishtees are one of the most ancient and interesting Mahomedan tribes now in India, and are descended from the first Mahomedan settlers, who were Arabs. One of the early Arabian missionaries belonged to the Arab (Bedouin) tribe of Chishtee, and, from his holy life and religious zeal, became, after his death, one of the principal Mahomedan saints of India. He died, and was buried at Pak Puttun, in the thirteenth century. This tribe or clan still exists in the Mooltan district, and as his descendants are esteemed honourable, if not sacred, his tomb is visited by vast numbers of pious Mahomedans from all parts of India, who have made vows of pilgrimage for particular objects, while his votaries believe that miracles are still performed there to the really faithful. It is not a little curious, perhaps, that the Chishtees still preserve their distinct national colour and physiognomy almost unchanged. It is esteemed an honour to marry the daughter of a Chishtee, and the men do not ordinarily marry out of their own tribe. Chishtees are found in many parts of India, who also claim to be descendants of the original saint, and they invariably receive honours as sacred pereons.

In Mooltan, the Chishtees are for the most part landholders and cultivators, though some affect austere religious lives. They are a peaceful, industrious tribe, settled on the banks of the river Sutlej; bigoted, very strict, and orthodox Mahomedans of the Soonnee sect, and more than ordinarily educated in the practice and doctrines of their faith.

No. 42. Khulleefa Daood

Khulleefa Daood is a Mahomedan, and belongs to the so-called Buni Israeel, *i.e.*, descendants of Israel; in other words, he is of Jewish origin. His ancestors originally came to Hindostan with the Emperor Allah-oo-Deen Ghoree from Persia, and the tribe have since resided in the city of Coel (Allyghur) for upwards of 800 years. The males of this family were for many generations employed as tutors to the sons of the reigning kings. Since the British accession they have taken service under Government in various capacities in the civil department. They are orthodox Mahomedans of the Soonnee sect, shrewd and clever, with a disposition for intrigue.

No. 42. Cashmiri.

Mahomedan merchants from Cashmere are very commonly met with at Simla, and, indeed, in all the northern stations of India. They bring shawls, scarves, embroidered cloths, and other local manufactures for sale, as well as dried fruits, which are readily disposed of. They are, for the most part, Soonnies, and have a strong admixture of Affghan blood; but, as a rule, they are not a military class

They are, however, a fine, handsome race of people, and their women, who have not unfrequently fair, ruddy complexions, are esteemed very beautiful.

No. 44. Izzut Ali Khan.

Izzut Ali Khan, the subject of the photograph, is a Mussulman inhabitant of Coel (Allyghur), where his family has dwelt for seven or eight centuries. They are landed proprietors and holders of some rent-free grants conferred by early Mahomedan authorities, on the proceeds of which they live. As a general rule, this class of Mahomedans is extremely ignorant, and has not been affected by the educational measures which have been provided by Government, any more than by the local teachers of their own sect.

No. 45. Sheikh Zeaoollah.

Sheikh Zeaoollah is a Mahomedan of the Sheikh sect, and resides at Coel (Allyghur), where the family has been located for eight or nine hundred years. They are landholders, but their chief occupation is that of managers of the shrine of the saint Shah Jumal Shumsool-arfeen, from whom they claim descent.

No. 46. Sumneus Khan.

Sumneus Khan belongs to the Ranghurs, descendants of some of the Rajpoot clans of Hissar, who were forcibly converted to Mahomedanism in the 14th century.

The Ranghurs are agriculturists, though not very skilful ones; but they have the deepest attachment to their native villages and hereditary lands.

The Ranghurs are a proud, turbulent, and domineering class of men; given to robbery, but not to theft; careless of money, and jealous of honour; and they are brave, and more to be depended upon for good or ill than most castes.

No. 47. Gholam Mahomed, of the Wuttoo tribe.

This tribe is a branch of the Bhuttees, who were the original immigrants into the North-west provinces from Jeysulmere, and become voluntary converts to Mahomedanism in the reign of Aurungzebe. They are ignorant, fanatical, and unprogressive. Many Hindoo customs still exist among the tribe, especially among their women, at marriages, and other domestic ceremonies. The greater proportion of them are agriculturists, but some are merchants in a limited capacity, and few of the Wuttoos are rich, or have the intelligence to become so.

No. 48. The Mulliks.

The Mulliks are considered by other tribes of Mahomedans a distinct race. The ignorant think that they are of giant origin; but learned Mahomedans suppose that they were degenerate Hindoo Rajpoots who embraced Islam in the reign of Mahomed Ghoree.

The Mulliks reside chiefly in the province of Behar. They cultivate land, and the wealthy among them possess extensive landed property.

The are chiefly employed in the management of landed property, and fill the subordinate offices of Brahils, Village Gomashtas, and Peeadas.

No. 49. Bhali Sooltans.

The Bhali Sooltans are a Mahomedan tribe of Oude. It is reported that, several centuries ago, Rae Buriar, a Bais Rajpoot and horse merchant, came from Baiswara in Oude, and married two women, by whom he had a numerous progeny. In the course of time they became sufficiently numerous and powerful to expel the Bhur proprietors or zemindars, and to take entire possession of their villages.

No. 50. Sheikhs.

The Sheikhs, in the Punjaub, belonged probably to the lower orders of Hindoos and are in no respect different from ordinary Mahomedans; they are to be found all over the Punjaub, and in all manner of employments.

No. 51. Hyder Buksh.—Kumboh Sheikh.

Much difference of opinion prevails among well-informed natives as to the derivation of the term Kumboh (Sheikh, signifying lord, and being the appellation of a very large Mussulman tribe throughout the East, most of whom claim descent from one of the first three caliphs).

But according to their own (and seemingly the most probable) account, the Kumbohs are the old inhabitants of the trans-Indus country, who were converted to Islam by Mahmood of Ghuzni.

Kumbohs abound in Etah, Rohilcund, and Meerut. They uphold the doctrine of the Jehad, or extermination of the infidels.

Many of the Sheikh tribe are found among our irregular cavalry, but they rarely enlist in the infantry. They are not given to agriculture, and are bad cultivators; but many are acute and successful traders, and many are to be found among the native civil subordinates in the various branches of Government service.

No. 52. Mobarik Ali Khan.

Mobarik Ali, like Hyder Buksh, is a Kumboh Sheikh, and a Soonnee Mussulman His title or appellation of "Khan" does not belong to his tribe, and was probably gained by a member of his family under the Mahomedan empire, when Khan was the lowest order of created nobility.

No. 53. Moulvees.

The photograph represents three doctors of Mahomedan law, or Moulvees, in discussion, perhaps on some knotty point in the text, on which the figure on the left has placed his hand, while the other two are listening to what he has to say. They form a very characteristic group of a class of learned men, who are perhaps decreasing under lack of patronage and exercise for their talents and knowledge, which is a necessary result of British Government. As a class they cannot be supposed to hold our administration in any particular regard or esteem, since they are necessarily deprived of the extensive advantages they would have possessed under their ancient Mahomedan rule. Under our own administration of the country, however, Mahomedan law still occupies a prominent place, and all property belonging to Mahomedans is inherited, divided, or

litigated, under that law. Thus marriage settlements are drawn up by Moulvees, and the separate shares of widows, sons, and daughters, of all families of Mahomedans are defined by them. Wills are written by them, and conveyances and deeds of gift in special cases; in short, the civil law business of the Mahomedan people of India is in their hands. English judges are supposed to be conversant with Mahomedan law; but there are many points in which the general direction of a competent law officer is needful, and a Moulvee who has passed a prescribed examination is attached to every civil court.

There are no more strict or bigoted professors of the Mahomedan faith than the Moulvees of India. They surpass in these respects, in a great degree, the Ulemas of Turkey and Egypt, who occupy an equivalent position in social life. They are, as they believe they ought to be, consistent opposers of, and enemies to, all infidels; else they read the Koran and other holy books to little purpose. They believe there ought to be no rival to the creed of the prophet, and they tolerate none. It is not in regard to the departed glories of an imperial government only that they grieve, but that rival religions exist and progress. The reforms, the admission to national privileges of Christians granted by the Sultan of Turkey, are by them considered heretical and abominable.

No. 54. Moulvee Kwajeh Torab Ali.

Kwajeh Torab Ali, a Mussulman, as indicated by his name, is an inhabitant of Coel (Allyghur), where he is, as the title Moulvee denotes, a lawyer, and pleads in the civil courts. He also possesses lands, and trades in indigo. The term "Kwajeh" is applied to all the members of this fraternity, because their ancestors were retainers or household servants of some of the reigning Kings of Delhi.

No. 55. A Kazi of Bareilly.

The title of Kazi, or Kadi, will be familiar to the general reader as that of a Mahomedan law officer, attached to all Mahomedan states and communities. His offices in India extended more particularly to social questions, and the Kazi was in turn censor of public morals, director of local religious rites and festivals, and administrator of ecclesiastical law. Under the Mahomedan government of India, Kazis were appointed to all districts according to their size and the amount of Mahomedan population. Their duties were to direct ceremonials, to see that periods of festivals and fasts were properly observed: to perform marriages, of which the Kazi was the registrar, as well as of deaths: to officiate at the ceremonies connected with the birth of children and purification of women: at all circumcisions, either in person, or by deputy, and thus generally at all household as well as public ceremonials. It may be said, indeed, that from the birth to the grave, the Kazi's offices are perpetual in every Mahomedan family, and cannot be dispensed with. In some cases, when the rank and learning of the Kazi fitted him for the office, he acted as judge for his district, both in civil and criminal cases; but such instances were comparatively rare under the Imperial Moghul government, the judicial establishments for the most part, being kept separate from those of the Kazis.

No. 56. Muhawuts.

This class is found all over the northern provinces. Their chief occupation is ear-cleaning and cupping; the latter operation being performed by a cow's horn, with a hole at the pointed end, through which they draw and exhaust the air. They are not migratory, and are settled chiefly in large cities, where they practice as a low order of what may be termed quack doctors. Their religion is Mahomedan.

No. 57. Mussulman Female.

The person represented in the photograph is married; and is the wife of one of the bridge keepers on the Ganges canal, near Hurdwar, who is in the employ of Government, and, therefore, in a humble but respectable class of life. It is probable that she was not secluded; but like many women of the poorer classes of Mahomedans, dispensed with that custom owing to inability to keep servants to do the outside work of the house, fetch water, &c. The mark of her marriage is worn about her neck, in a small bead necklace called Pote, common both to Mahomedans and Hindoos all over India. This is tied round the bride's neck at the marriage ceremony by the bridegroom's mother, or other near female relative, immediately after the Kazi who has performed the rites has given the following blessing: "O, great God, grant that mutual love may reign "between this couple as it existed between Adam "and Eve, Abraham and Sara, Moses and Zipporah, "his Highness Mahomed Moostafa and Ayesha, "&c." The necklace is now handed to the person who is to fasten it around the bride's neck, with a piece of sugar candy, which the bride is to eat, as emblematical of the sweets of matrimony, while the beads are being adjusted. After this, they are never removed, except to be rethreaded upon new string, and it is considered a very unlucky omen if they should ever be accidentally broken.

No. 58. Diljan.

Diljan, the "heart of life," is a Mahomedan courtezan. Her dress is a black tunic, black silk trousers, and Cashmere shawl.

No. 59. Wuzeerun.—Bazar woman.

This photograph represents a Mahomedan bazar woman, or professional courtezan. Her dress is a yellow tunic, green silk trowsers, and red Cashmere shawl.

No. 60. Zahore Begum.

Zahore Begum is a Cashmere Mussulmani, and follows the profession of a courtezan. She belongs to the Soonee sect of Mussulmans.

She has a very fair complexion, black hair and eyes; she wears a black silk dress and yellow shawl, diamond and emerald ornaments over the forehead and round the neck; a diamond ring on her left thumb, cloth shoes, embroidered with gold and set with precious stones, and her silver anklets have small bells attached to them.

g.—Religious Devotees.

No. 61. Akalee.

The Akalees form one of the five great divisions of religious mendicants among the Sikhs; though they can hardly be considered mendicants in a strictly religious sense, being rather fanatical soldiers who have become a class, than devotees like the Oodassees, Nanuk Shahees, and others, who affect a strictly religious life accompanied by severe ascetic penances. As represented in the photograph, the Akalee is always armed to the teeth. His high conical turban, like the rest of his dress of a blue colour, is encircled by rings of sharp steel quoits, in the use of which he is very skilful. The rest of his arms are a sword and shield, a steel bow of the ancient Parthian pattern, with a brace of horse pistols, or a collection of daggers in his waistband. In this equipment the Akalee is a truly grim and formidable looking person; and in most of the fraternity there is a peculiar wildness of expression, partly owing to fanatical spirit, and partly to the habitual use of intoxicating drugs. In the former Sikh army Akalees were a prominent feature. They submitted to no discipline, but joined together in bodies, and often performed reckless feats of valour. At present it is only in native states, at Hyderabad in the Deccan, for instance, where the Akalees in all their pristine fierceness and defiance of order are to be met with; and their wild figures when in company with bands of their own countrymen who serve as soldiers, are always very remarkable.

No. 62. Tun Sookh Doss.

Tun Sookh Doss is a Bairagi or Hindoo religious mendicant. He is a resident of Fyzabad in Oude, and has been dragged from thence to the Mela-Magh Fair at Allahabad.

Bairagis (Hindoo) and Fakirs (Mahomedan) religious mendicants, abound in the vicinity of Fyzabad, where some eleemosynary institutions, generally managed by some one or more of the order, are maintained by the wealthier landowners for their support. One large establishment near the city of Awadh has a revenue of more than 50,000 rupees. It was instituted by Shooja-ood-dowla, himself a Mussulman, for the exclusive use and behoof of Hindoo religious mendicants (bairagis). No Mussulman is allowed to enter its walls, and the revenues are absorbed by about 500 resident and itinerant bairagis, who under the authority of their malik or abbot, manage the estates themselves, taking a moderate rent, which is never augmented.

No. 63. Bairagee.

The subject of the present photograph is a Jat. He has left wife and children under an irresistible religious zeal, and, forswearing the world, has become a Bairagee. The broad trident of Vishnu is painted on his forehead, the sides white, with red between, and he worships Krishna, as an incarnation of Vishnu. On his head is a tinsel crown, worn over a skull cap, instead of a turban; and on a bamboo pole, covered with red cotton cloth, upon his shoulders, decked with gay peacock's feathers and wild flowers, are slung two baskets covered with red or orange cotton cloth, which contain pots of Ganges water. He may have filled these at the great festival of Hurdwar, and is most likely on his way to Dwarka, in Goojerat, where he has made a vow to pour the contents over the holy image of Krishna worshipped there.

No. 64. Bairagees.

In this group the foreheads of the Bairagees are marked with the broad trident of Vishnu, red in the centre, and white on each side. The sitting figure has covered himself with wood ashes only; the old man standing has marked himself with his usual caste marks about the body, and wears a coarse black blanket thrown over his left shoulder.

No. 65. Mohunts of Hunooman-gurhee.

Hunooman is the name of the monkey which, according to the legend of the Ramayan, is said to have headed the army of King Ram, of Ajoodhia, when he invaded Ceylon in remote times. A temple was afterwards erected for the worship of Hunooman at Ajoodhia, which became renowned for its magnificence and the number of its votaries.

Some two thousand years ago, Raja Bikrama Dutt of Oojeyn, added to the temple, and bestowed a small idol upon it. A well is said to be all that exists of the ancient edifice. It is not known who were the original priests of the temple; but the present occupants came from Jeypoor two or three centuries ago, and and took possession of it when Mahomedan intolerance had almost reduced it to ruin, and they finished the present building, which is on a lofty mound, and resembles a castle, with a long flight of steps ascending to the entrance. They also made the present idol, which is in the form of a monkey, and is decorated with costly jewels.

There are four or five hundred Bairagees, or religious mendicants, attached to the temple, who take it by turns to go begging all over India; and twice a year hundreds of thousands of pilgrims come from remote distances to make offerings to the shrine; the income of the temple from these sources is believed to be very considerable. The Mohunts are the chief authorities, or as they may be termed abbots of this great Bairagee monastery.

h.—Bareilly Municipal Committee.

No. 66.

No. 1. Sheikh Khyrooddeen Ahmud Buhadoor Deputy Magistrate, Deputy Collector, and Secretary to the Municipal Committee,—This gentleman is distinguished for his loyalty to our Government. He was educated at the Bareilly College.

No. 2. Lalla Luchminarain.—A Khutri. Formerly an inhabitant of Delhi, and now the head of a large banking firm at Bareilly. He was educated at the Bareilly College, and speaks and writes English.

No. 3. Nawab Neamut Khan.—Is descended from Hafiz Rehmut Khan, the former ruler of Rohilcund.

Neamut Khan remained loyal when his cousin, Khan Buhadoor Khan (afterwards hanged for murder during the revolt), rebelled against the British Government in 1857.

No. 4. Rajah Khyratee Loll.—Khayet. A large landholder in the Bareilly district.

No. 5. Moonshee Buldeo Singh.—Is of the same caste, and is also a considerable landholder.

No. 6. Gujadhur Loll.—A Bunnea by caste, and a large sugar manufacturer and banker of Bareilly.

i.—Trading Classes.

No. 67. Hotee Loll.

Hotee Loll is a Hindoo belonging to the Bunneah, or trading caste, and of the Baraysanee sept. He is an inhabitant of Hattrass, a large commercial town in the district of Allyghur, of which he is a native.

No. 68. Ram Persad—Muhajun.

Ram Persad is a Bukal and an Ugurwallah by caste, and a Muhajun or banker by profession. The Ugurwallah Muhajuns are famous in India for the correctness and universality of their exchange and bill transactions, and for their industry as merchants of money. Many of the class are men of enormous wealth, and their agencies extend all over India.

They recognise and support the authority of Deans of Guild, according to the most ancient Hindoo principles, and their disputes are almost invariably referred to Punchayets, or arbitrations among themselves, in preference to resorting to courts of justice.

No. 69. Shroffs.

Shroffs are not always Bunneas, though the person illustrated may have been one. They are not unfrequently Brahmins, who have adopted a secular calling, and deal in money — Khutris, and other castes, Vaisya and Sudra. Their trade is the exchange of money, the giving change for rupees in pyce or copper coin, and for pyce in cowries.

In the higher branches of his calling, the Shroff discounts hoondees, or bills of exchange, bonds, and promissory notes. He deals also in bullion, in small or large quantities, buys and sells ornaments, old and new pearls, and precious stones of all kinds. Finally, he lends money, generally on pledges of gold and silver ornaments, in small proportion to their value, but at moderate interest.

No. 70. Bunnea.

Bunneas are universal all over India. They are the hucksters or small traders of the people. A Bunnea's shop or stall contains meal and fine flour of wheat, with sogie or semoline, meal of millets and different kinds of pulse, rice, split peas, and pulse of many kinds; for all these are used in the farinaceous diet of the people, which is almost universal. He sells also parched rice and peas, gram, or horse corn, and generally every article of food, except vegetables and meat, with which he has no concern. Besides these he has condiments, salt, chillies, black pepper, green and dry ginger, and garlic (but not onions), not omitting hing or assafœtida, which is used (a mere *soupçon*), with a peculiar lichen, by high caste people to purify and flavour made dishes. He has also a small store of spices—cassia, cardamoms, cloves, and mace; sugar, too, of various kinds; goor, or molasses; and, in some instances, sweetmeats; but they are never good. He sells also ghee, and many have some fresh butter in the mornings for their Mahomedan customers; but it is a perishable article, while ghee only becomes (if not well boiled) occasionally rancid in hot weather, and can be re-boiled. In short, the Bunnea is grocer and purveyor in general in every village and town in India.

The Bunneas also lend money, and exact usurious interest; three per cent. a month compound interest is not, perhaps, extravagant, and is sometimes increased to four or five, except in case of pledges of gold or silver, when the rate may be as low as 12 per cent., or even less.

No. 71. Marwarrees.

These, for the most part, are originally natives of Jondhpoor and Jeypoor, in Rajpootana, though they come from all parts of those provinces which bear the general title. They are Vaisya Bunneas, men of good caste, and, as a class, by far the most energetic and persevering of native merchants, whether as wholesale or retail dealers. Gradually the Marwarree Bunnea has penetrated to most parts of India. He is found in Bengal, though not perhaps very numerously, for the Bengali Bunnea is as sharp in business as himself, and, as a pithy Hindi proverb expresses it, "two swords cannot stay in one scabbard." The Marwarree, therefore, has gone south. He has spread all over Malwah and Bundelcund; over Nagpoor, Berar, and the Deccan generally. At Hyderabad the fraternity is in great strength.

They marry only within their own gotes or clans, and most usually only one wife. They are a fine handsome race, with strong features; sometimes, especially their women, very fair, and even ruddy, with grey or blue eyes, the evidence of a pure descent from most likely an ancient Aryan stock.

No. 72. Khutree.

Khutrees are a Hindoo sect, who are the chief penmen of Northern India, and act as accountants, secretaries, village registrars, merchants, and petty traders.

In the Hazara the Khutrees are settled amongst an almost entirely Mahomedan population, have a monopoly of money-lending and general trade, and by their natural shrewdness and usefulness have become necessary to the rude people among whom they dwell. A Khutree is a necessary inhabitant of every village, and though bitterly despised for his idolatrous faith, is yet protected and esteemed.

No. 73. Bhabra.

The Bhabras are a division of the Jains, one of the most ancient sects of India, and are decided schismatics from Braminical Hindooism.

They are immigrants into the Punjab from Rajpootana, and are all merchants and traders: a gentle, quiet, inoffensive, money-getting class, of excellent character, and of very industrious habits. The Bhabras carry the desire not to take away life to an extreme degree; noxious vermin, wild beasts, and even insects, are included in the same category; and the contrivances not to destroy the latter, even in the purification and cleansing of their houses and apparel, is carried to such an extent as to effect their apparent cleanliness.

No. 74. Shadi Seth.

Shadi Seth is an inhabitant of Bhagput, a large town in the Meerut district, and belongs to the Surongie division of the Bunnya, or shopkeeping tribe, who are Jains.

No. 75. Brinjara and Wife.

Under the designation of Brinjara or Bunjara, Lamanee or Lumbanee, this useful and interesting tribe is found all over India. In the north-west Provinces they inhabit the jungles on the southern faces of the lowest ranges of the Himalayas, never penetrating deep into the forests, but selecting for their encampments those portions of open grass lands. chequered by patches of wood, which afford good grazing grounds for their large herds of carriage bullocks. They have no settled places of habitation. During the dry months—that is, from October to June—they travel through the country, transporting salt, ghee, grain, or other produce, from place to place; sometimes trading upon their own account, but for the most part carrying for grain dealers and merchants at a low rate of charge, which is paid in kind or in money, as may be agreed upon.

The men are bold, patient, hardy, and venturous; and among all classes of merchants in India have acquired, as is their due, a reputation for perfect honesty. No matter how long, or how arduous the march, or how great the value of the goods they carry, they deliver them according to promise. In marches of hundreds of miles along unfrequented roads, without anyone to overlook them or guard them, the Brinjaree convoys travel patiently and persistently, and deliver their invoices correctly.

j.—Artisans and Labourers.

No. 76. Sonar.

The Sonar or gold and silversmith is an indispensable member of the Indian social condition of life; and he is to be found in every village, almost in every hamlet, as well as in all towns and cities. In the Deccan, where original national institutions are preserved in village communes, and wherever they are at present existent throughout India—the Sonar is a member of the hereditary village council, which includes the carpenter and blacksmith, the potter, and other useful and indispensable mechanics, and is twelve in number, presided over by the patell, the hereditary magistrate or head manager.

No. 77. Weavers.

No. 78. Dyers.

No. 79. Blacksmiths.

No. 80. Carpenters.

No. 81. Kumhars or Potters.

No. 82. Zunlozis or Brocade-weavers.

No. 83. Scarf Makers.

No. 84. Bheesties or Water-carriers.

No. 85. Aheer.

Aheers are keepers and tenders of cows and buffaloes; they trade only upon milk, and the preparations from it. They never keep goats or sheep, but breed and feed calves; selling them, however, as soon as they are fit to work as bullocks, or indeed, generally as soon as the calves are well reared, to persons who train them for carriage or for draft.

k.—Wandering Tribes and Gipsies.

No. 86. Bhat.

Bhat, also Bharat and Bhattu, is the Hindoo equivalent for bard, herald, genealogist, and chronicler. He is to be found all over India, and fulfils the same office as his prototype, but with inferior dignity, although in Western India, where he is identified with the Charun, his personal security is held sufficient for the payment of a debt or the fulfilment of an engagement, its violation being followed by the voluntary death, either of the Bhat himself or of some member of his family, the retribution of which falls on the defaulter.

No. 87. Bhât.—Mussulman.

The specimen photographed comes from Umroha, a town in Moradabad, full of old and decayed Mahomedan families. The occupation of the Bhât shown in this photograph is the narration of family traditions and legends, and remarkable historical and other local events, many of which are very curious and interesting. The Bhâts may be considered as much the hereditary depositaries and professors of this knowledge as the ancient bards were in Britain The offices of both correspond exactly. The Bhât is well paid and fed for his work.

No. 88. Mirassees.

Mirassees, or minstrels, are not a reputable class of people, and are generally employed by dancing girls to play to them, when engaged to dance or sing at nautches.

The principal native musical instruments are the surinda, or violin; the choutura, or guitar; tuphla, or drum; and the sunod. The last is the leading instrument, and is sounded with a plectum, like other native guitars. The Surinda plays in unison with it, while the choutura forms a kind of bass accompaniment.

No. 89. Jogis.

These Jogis must not be confounded with Jogis who are religious devotees. They are a low caste, migratory tribe, found almost all over India, who share the profession of catching, and to a certain extent, taming snakes, with Mahomedans of the same character. The photograph displays two of the tribe exhibiting cobra capellas, or nags, and playing to them upon an instrument made of a gourd of peculiar shape, into which a reed with holes is fitted, which has six holes; sometimes there are two reeds set side by side. The sound is like that of a flageolet, and is often mellow and sweet, but there is little attempt made at time or melody.

No. 90. Deena and his nephew Hooseinee —Snake Charmers.

Their occupation is exhibiting harmless snakes, and catching or charming venomous ones. Their tribe is migratory; going from place to place during the cold and hot months of the year, and remaining in one spot during the rainy season. They are Mussulmans of the Soonee sect, and have a great veneration for the memory of a deceased Fakir or saint called Madar Shah, who is buried at Mukunpore, in the Cawnpore district; they believe that the three most sacred places on earth, are Mecca, Medina, and Mukunpore, and the three objects of worship are—Moulah, namely the Almighty, Mahomed, and Madar Shah.

No. 91. Nuts.

Nuts or Nâths, called in Western India Nutwa, correspond to the European gipsy tribes, and, like them, have no settled home. They are arrant thieves, and their principal occupations are conjuring, dancing, and tricks of legerdemain. The men are very active and clever as acrobats. The women attend their performances, and sing and play on small native drums or tamborines. They also affect knowledge of the science of palmistry, and prepare and sell love philtres and other charms. The Nâths do not mix with or intermarry with other tribes. They live for the most part in tents made of black blanket stuff, and move from village to village through all parts of the country. Some of the men are skilful blacksmiths, and the women make patchwork quilts, frequently very ingenious in pattern and neatly sewn.

It is difficult to say whether Nâths are Hindoos or Mahomedans, as they have indifferently Hindoo and Mahomedan names, and practise the observances of both religions, intermixed with strange ceremonies of their own at marriages and other festivals, which are kept secret among them.

No. 92. Gwal Nut.

Gwal Nut is a gipsy woman.

No. 93. Kesarah—Nutni.

Black hair and eyes, complexion rather dark, black dress, with figured boddice over the bosom, coral necklace, and head-dress of silver beads with a knot on the top made of cowries, a white scarf over the head and shoulders. Age, seventeen years; height, five feet six inches.

No. 94. Sookha Kunjur.

Kunjurs are for the most part a wandering thievish race, resembling gipsies, and are to be found in nearly all parts of India. They live by snaring wild animals, making ropes and twine, as well as brushes of cocanut fibre, used by weavers. Being of degraded and filthy habits, they are reckoned a very low caste; living on the flesh of wild animals of every description, and not even sparing carrion.

No. 95. Sanseeas.

Sanseeas are neither Hindoos nor Mahomedans in reality, but profess to be Hindoos, and do not practise circumcision, by which rite alone they could become Mahomedans. They are essentially outcasts, admitted to no other caste fellowship, ministered to by no priests, without any ostensible calling or profession, totally ignorant of everything but their hereditary crime, and with no settled place of residence whatever; they wander as they please over the land, assuming any disguise they may need, and for ever preying upon its people.

B.—ABORIGINAL, LOCAL, AND FRONTIER TRIBES OF NORTHERN INDIA.

a.—Bengal and Behar.

No. 96. The Coles of Chota Nagpore.

The total area of Chota Nagpore is estimated at 4,468 square miles, with a population of 645,359 souls, of whom about one-half are what are known to Europeans by the name of Coles. The word Col or Kol is an epithet of opprobrium applied to these tribes by the Hindoos. It includes many tribes, but the people of Chota Nagpore to whom it is generally applied are either Moondahs or Oraons; and though the two races are found in many parts of the country occupying the same villages, cultivating the same fields, celebrating together the same festivals, and enjoying the same amusements, they do not intermarry. The uniform tradition in Chota Nagpore is, that the Moondahs were the first settlers, and thus acquired certain proprietary rights in the soil, which they are most tenacious of to this day.

Physically, the Moondahs are the finer race of the two; they are taller, fairer, better proportioned, and

have more intellectual features. The Oraons are generally a dark-complexioned, short, thick-set race, with round, good-humoured faces of rather a lower type; but neither are wanting in intelligence. The Oraons are the more industrious and energetic; and it is generally people of their tribe that, under the denomination Dhangur, are employed on great works in all parts of India and in the colonies.

No. 97. The Korewahs.

The Korewahs are a very wild tribe, occupying a portion of the water-shed of Central India, near the sources of the Soane and its tributaries, the sources of the Nurbudda, and the sources of the Eeb and other tributaries of the Mahanuddee. The language spoken by the Korewahs shows at once that they are near of kin to the Sonthals and Moondahs, or Coles of Chota Nagpore and Singbhoom; and, like their kindred races, they are greatly devoted to songs and dances. In customs there appears but little difference between them and the Moondahs, but those of the Korewahs, from their isolation, are uncertain. They burn their dead, or bury them, as they find most convenient, but the practice of marking the spot where the body or ashes have been deposited, by a large flat stone, is common to them and the Moondahs.

No. 98. Oraon Cole Female, Chota Nagpoor.

No. 99. Moonda Female, Chota Nagpoor.

No. 100. Rajbansi.

Rajbunsi, or Rajbansi, is the modern name of a people of Kooch-Behar, originally belonging to the great Kooch tribe. In course of time, the mass of the Kooch people became Mahomedans, and the higher grades Hindus; both style themselves Rajbansis; a remnant only endure the name of Kooch, and of these but a portion adheres to the language, creed, and customs of their forefathers.

b.—Assam.

No. 101. Sonai, Assam.

No. 102. Moamurias or Muttucks.

The Muttucks are a tribe settled in a district called Mooran or Muttuck. After the conquest of Assam by the British Government, the chief of the Muttucks and his family were induced to abandon the state of semi-independence in which they had previously existed, and were pensioned off. Since that period, the Muttucks have diligently pursued their favourite occupations of husbandry. The tea plant is indigenous in the Muttock territory.

No. 103. Meeree, or Miri.

The Meerees inhabit the northern part of Assam, and are of Indo-Chinese origin; as is indicated both by their features and by the monosyllabic character of their language.

No. 104. Singphos.

The Singphos are by far the most powerful and formidable of all the hill tribes on the northern frontier of Assam; they are also the most numerous. and scattered over the widest extent of country. They are divided into twelve tribes, and have four castes, named Thengai, Myung, Lubrung, and Mirup.

They are believed not to be a branch of the Shan tribes, but of Indo-Chinese origin, and their own traditions point to the confines of Tibet as their original location. Their language, which is monosyllabic, is unwritten: its intonations are very similar to the Burmese, and its grammatical construction almost the same.

The houses of the Singphos are generally nothing but long sheds, roofed in with grass or bamboo leaves, and the walls composed of split bamboo. The floor of the dwelling part is raised about four feet from the ground, and the entrance forms an extensive porch, in which are congregated pigs, fowls, household and agricultural implements, and where women may generally be seen pounding rice. These buildings are sometimes one hundred feet long, and are divided into compartments, allotted to several families. Occasionally immense houses may seen, which are occupied by powerful chiefs, the timbers of these buildings being of such enormous size and length as to render it a matter of surprise that they could have been erected by mere manual labour.

c.—Sikhim.

Nos. 105–106. Lepchas.

The "Lepchas," so called by us, and indeed by themselves in conversation with strangers, are divided into two races; viz., "Rong" and "Khámbá." Thus Lepchas are found among the subjects of eastern Nipal, throughout the whole of Sikhim, and extend to an unknown distance into Bhootan. The Hindoo restrictions as to caste are not admitted by the Lepchas, although those who live under the Nipal government are obliged to conform to the Hindoo laws of that state. They are gross feeders, eating all kinds of animal food, including the elephant, rhinoceros, and monkey, and all grains and vegetables known to us, with the addition of many roots and plants altogether excluded from our culinary lists. Pork is their favourite meat; next to that, beef, goat, and mutton. The yák is considered the best beef; next to that, the flesh of the Sikhim cow (a fine animal); and last, the Bengali and common cow. Their common drink is a kind of beer made from the fermented infusion of Indian corn and murwa, which is weak, but agreeably acid, and very refreshing. They do not form permanent villages, and rarely remain longer than three years in one place, at the expiration of which they move into the new part of the forest, sometimes near, often distant, and there go through the labour of clearing

a space for a house, building a new one, and preparing the ground for a crop.

The Lepchas, like true Buddhists, bury their dead. In person they are short, averaging about five feet in height. Five feet six is above the usual height, and four feet eight is a common stature among the men. The total absence of beard, and the fashion of parting the hair along the crown of the head, adds to a somewhat womanly expression of countenance in the men, and the loose jacket with wide sleeves which they wear, contributes still more to render it rather difficult for strangers to distinguish the sexes, especially in middle age.

Nos. 107–108. Bhotias, Sikhim.

The Sikhim Bhotias are those subjects of Sikhim who live in the valleys approaching the snowy range, as distinguished from the inhabitants of the Terai, or sub-Himalayan part of the country, who are mostly of Meech origin. Bhotias extend along the whole line of the passes leading to the plains from the Himalayan range; and, with the name, have generally retained unchanged the lingual and physical characteristics, and even the manners, customs, and dress of their transnivean brethren the Tibetans.

d.—Nipal and Simla.

No. 109. Limboos.

The term Limboo is a corruption of Ekthoomba, and is generally used to designate the whole population of the mountainous country lying between the Dood-Koosi and the Kanki rivers, in Nipal. Their original country is Chung, in Tibet. Although they have been long in close contact with the Hindoos, there is not any perceptible mixture of the blood to be observed, whether in more regular features, or in the absence of the small low nose of the Mongolian races, and presence of the beard. In religion they are neither Hindoos nor Buddhists; though they outwardly conform, as their locality requires, to the practices of either creed. They believe in one great god, called Sham-mung, and worship many minor deities.

No. 110. Magars.

The Magars are a tribe of no very great magnitude, resident in Nipal. They are unquestionably a people of the southern side of the Himalayas, and their original country is Sikhim, from which they were first driven west by the Lepchas across the Meehi and Konki rivers, and thence further west by the Limboos beyond the Arun and Doodkooshi. They are largely enlisted into the Nipalese army, and are excellent soldiers, having formed a considerable portion of the Goorkha regiment enlisted by Sir C. Napier in 1850.

No. 111. Goorung (Nipal).

The Goorungs of Nipal are a division of the "Purbuttiahs," and therefore nominally Hindoos. They live on the hills, uniformly selecting an altitude of 5,000 or 6,000 feet, especially between Jumla and Kirant, where they rear immense flocks of the Barwal goat. They exhibit, in common with most of the aboriginal tribes of Nipal, a modified form of the Mongolian type, retaining, like the Magars, their own vernacular tongue, though, from long intermixture with the Khas, they have also acquired the language of the latter.

From their energy of character, love of enterprise, freedom from the shackles of caste, unadulterated military habits, and perfect subjectibility to discipline, they are eminently fitted for a military life.

No. 112. Goorkha, Brahmin, and Sood.

Members of the three principal classes in Nipal are here represented. The short, square figure on the proper right of the group is a Goorkha. He belongs to the Khas, or Kshuttrie division of the people, which, though of aboriginal descent, claims to belong to the ancient military division of Hindooism, but has a marked distinction from the Rajpoot tribes of India. The true Goorkha has, so to speak, few Hindoo prejudices. He can eat any food except beef. He needs no particular care in making his cooking place, when absent from home; and is, in every respect, a better soldier than the Hindoo of the plains of Upper India.

The Goorkha represented, is in his ordinary costume, and armed with his national weapons, the bow, and the kookeri, or curved knife or bill, which, in his hands and at close quarters, is a very deadly weapon.

The middle figure of the group is a Nipalese Brahmin, who, as descended from Aryan stock, contrasts strongly with the Goorkha, whose progenitors were Turanian aborigines.

Although strong by religious position, the Brahmins of Nipal do not ever appear to have aspired to the condition of rulers of the country. The present royal family belongs to the Khas, which in its turn has twelve subdivisions, again divided into many separate clans, which rank, as it were, in groups. Beside the Khas, there are also Ektharga, Thakoori, Magar, and Garung, which are exclusively military tribes (Kshuttries), subdivided, like the Khas, into clans or families, whose designations are derived evidently from local and aboriginal sources, and prove that the influence of Brahminism did not affect the original constitution of the military tribes who accepted Hindooism as a religion.

The third figure is a Sood, who represents the mercantile class of Nipal, but which is now much scattered along the frontier, and into the Punjab.

e.—Tibet.

No. 113. Bhotia, Buddhist.

The inhabitants of the Himalayan valleys are of Tibetan origin; their language and associations differ from those of the people of the plains; to them the name Bhotia, which belongs in strictness to the inhabitants of Tibet only, is generally applied; the Tibetans proper being, on account of

the extreme height, ruggedness, and difficulty of the mountain passes, and the short period during which they remain open, comparatively but little known to the inhabitants of Hindostan.

Both Tibetans, and, with few exceptions, the so-called Bhotias, are Buddhists. Tibet is indeed the chief seat of this religion, and of its incarnate head, the Grand Lama. The influence of this spiritual lord extends over the whole of Central Asia, but the temporal power formerly exercised by him in Tibet has passed to the Chinese.

No. 114. Lama.

The Lama, or priest of Buddh, represented in the photograph, is a native of Tibet.

No. 115. Bhotia Female, Buddhist, near Lassa, Thibet.

No. 116. Tibetan Buddhist.

f. Oude and North-west Provinces.

No. 117. Bhur.

An aboriginal race of Hindostan, called also Rajbhur, Bhurat, and Bhurpatwa. Their original seat is traditionally stated to have been the whole country from Goruckpoor to Bundlekund, and a tract in Benares is from them called Bhurdoi, corruptly Bhadoi. Many of the old forts, and other constructions in the Benares and adjoining districts, are ascribed to them.

No. 118. Teehurs.

The quasi-aboriginal tribe called Teehur is not of a migratory character. A few families are found dispersed through villages, from which they rarely move unless pressed for employment. They have no fixed or defined religion, neither Hindoos nor Mahomedans acknowledge them, and the most solemn oath they can take is on the spirits they drink.

They are a despised race, very ignorant, and extremely expert as thieves, but nevertheless, generally laborious.

No. 119. Rajpoot Cultivators.

These peasants are residents of Jumnootri, or the source of the Jumna, and belong by caste to a Rajpoot race known as the Russia clan.

Their pretensions to the appellation is, however, very doubtful.

There is a great difference between the types of features of the lower Rajpoot tribes and the higher; the latter is unmistakeably Aryan, while the lower, as shown in the representation, is nearly allied to the aboriginal.

No. 120. Niltoo—Hindoo.

The subject of this photograph is Niltoo, a coolie or hill porter, carrying milk. He is a Hindoo, and by caste a Rajpoot of low degree, resident of Gurhwal.

g. Punjab.

No. 121. Daood Pootra.

The Daood Pootras, or sons of David, claim descent from the Caliph Abbas, paternal uncle of Mahomed. They are Soonnee Mahomedans, and the head of the tribe now holds the principality of Bahawulpoor, on the left bank of the Sutlej, near the junction of that river with the Indus. In the beginning of the last century, the Daood Pootras were known only as weavers and cultivators, and had displayed no martial character; local convulsions, however, enabled the head of the tribe to establish his clan at Bahawulpoor, where he has since maintained himself.

No. 122. Kakkazye.

The Kakkazyes were originally Hindoo Kullals who, though at some distant period converted to Mahomedan faith, have yet retained the hereditary occupation of their ancestors. They are numerous at Lahore, and maintain themselves as well by selling spirits, as by farming, trading in grain and wood, and the poorer classes as domestic servants. It is, perhaps, a strange illustration of the force of habit and attachment to caste profession, to find the Kakkazyes, though converts to Islamism, continuing a trade, or pursuit in life, which is expressly forbidden by the tenets they have adopted, under the most emphatic denunciations of divine wrath.

No. 123. Arora.

The Aroras are a caste of Hindoo tradesmen, who are numerous in the towns and villages of the Punjab; and the city of Mooltan is perhaps the principal place of their origin, and present residence.

They claim to belong to the Vayash, or Vaishya class of Hindoos, which is the third in the general system of caste rank, and is that to which most merchants and professional characters belong. The Aroras are, however, a weak sect only, and are hardly known in other parts of India. They trade in money and in exchanges, as well as in goods, produce, and manufactures; and, like the Jains, are an industrious, money-getting class, not over scrupulous in regard to usury.

No. 124. Raeens, or Arains.

It is comparatively rare to find any tribe or sect of Mahomedans who follow agriculture as an exclusive pursuit; but the Raeens, or Arains, belong to the agricultural classes of the Punjab and of the Hissar division of the North-west Provinces, and rarely, if ever, serve as soldiers. They belong to the Soonnee sect, and are not distinguished by

any difference with others in their profession of the Mahomedan faith; but, owing perhaps to their occupation, or Hindoo origin, they have adopted a vegetable more than an animal food diet, though they have no objection to eating meat under the ordinary rules of their faith.

h. AFGHAN TRIBES.

No. 125. Meer Allum Khan, Nowrun Khan, Mahomed Gool Khan.

Chiefs of the Gundapoor clan of Pathans, now settled at and in the vicinity of the town of Koolachee, on the Indus, in the province of Derajat.

They are a numerous tribe, who formerly employed themselves in trade between Kabool and India; but, in consequence of quarrels with the rulers of Kabool, they abandoned Afghanistan, and settled in their present locality as cultivators of the soil.

The Gundapoors are Soonnee Mahomedans, frank and hospitable, and free from the vices and treachery of the Afghans of the frontier.

No. 126. Dooranee.

The subject of the photograph has little of the strongly marked Jewish features of the Afghans in general, and they have more of an aboriginal character; but his long curly hair and peculiar head dress, a thickly quilted cap, round which a slight muslin turban is folded, are characteristic of the lower orders of Dooranees. They are Mahomedans of the Soonnee sect, and are strict and bigoted followers of their faith. In diet and habits they are not in any way different from other Mahomedans of the same persuasion. Brave, frank, and often hospitable, the Afghan character is yet deformed by many vices, among which treachery and implacable revenge are but too prominent.

No. 127. Afghan Group.

The plate gives a good idea of ordinary Afghans; strong, spare, sturdy men, handsome, yet with a peculiarly restless and and wild expression of countenance. They are industrious cultivators, brave and fearless soldiers, and, as merchants, bold. and enterprising; but their national character is untrustworthy and forbidding. Afghans rarely go unarmed and their favourite weapon is the sword, or sabre. Many of the Afghans are as fair as Englishmen, with ruddy complexions, and blue or grey eyes, and their women are undoubtedly very handsome. A finer race indeed, physically speaking, does not exist; nor, for the most part, a finer climate than that in which they dwell.

No. 128. Khuttuk Horseman.

The plate represents another man of the Khuttuk Afghans, who is a horseman, equipped after the fashion of the tribe in armour. Over his turban he wears a cap of light steel chain mail, part of which thickly quilted with cotton or wool, and fastened across his chest by straps, descends as far as his waist, and, when mounted, protects his back and arms. He has bright steel gauntlets reaching to the elbow, the leather covering for the hands being studded with bosses of steel or brass. His tunic is quilted cotton, thick enough to turn a sabre cut, and with strong jack boots reaching to the knee completes the costume. His arms are a light matchlock and sword, and his powder horns and bullet bag hang at his waist and on his right side.

The Khuttuks cannot, however, bring many horsemen into the field, and their strength lies in their foot soldiers, who are formidable in mountain warfare.

No. 129. Afreedee.

The Afreedees are one of the principal frontier tribes of the north-west, inhabiting the mountains and passes which lie west and south-west of Peshawur.

They are bold and sturdy soldiers, but restless and troublesome, as they always have been, from the period of the invasion of Alexander the Great to the present time. It is probable that at no period of the history of the frontier, have the Afreedees of the passes ever been so peaceably disposed as at present. Many of them have enlisted in our frontier, regiments, and serve very faithfully and creditably; but it is a question whether the wild character of these mountaineers can ever be materially changed.

Of all the frontier tribes the Afreedees are, indeed, the most numerous and important. Following the line of frontier from the north, the Afreedee territory commences in the hills between the Kabool river and the Khyber pass, and forms the western boundary of the Peshawur district till it approaches the lands of the Khuttuks, to be described hereafter. The Afreedee hills to the south, which are spurs from the mountains of Afghanistan, project into the British territory, and form the northern boundary of the Kohat district. Through these hills are two celebrated passes, the Kohat and Jewakee, and upon all traders and travellers to the southward the Afreedees have levied toll, or black mail, from a very remote period of time. To the west the Afreedees claim territory nearly to Kabool, and with the Ghilzyes are the special custodians, or, as they affirm, proprietors of the celebrated Khyber and Khoud Kabool passes. The tribe is independent, owing a nominal allegiance to the Ameer of Kabool, so long as their subsidies are paid, but, in reality, they own no government but that of their own chiefs.

No. 130. Khwajah Mahomed Khan and Son.

The Khuttuk clans inhabit a tract of hilly country lying south and south-west of Kohat, and including spurs of the great Sooliman range from Dullun, on the Upper Koorum river, to Kooshalgurh, on the Indus, and from the Bungush valley of Kohat to the Wuzeeree lands in Bunnoo. The men represented in the photograph are of the Baruk clan of the Khuttuks, which holds the most fertile portion of the Khuttuk country, and belongs to a respectable class in life. The Baruk Khuttuks are cultivators of the soil, and, for the most part, men of settled and peaceful habits; other portions of the tribe, however,

who inhabit the mountains, are a pastoral people, wilder and more restless than the cultivators, and differ little from Afreedees and other mountaineers.

No. 131. Mullik Ensal.

The Yaga Kheyl, to which the subject of the photograph belongs, is a clan of the Wuzeerees, a frontier tribe of the Derajat, a province lying south of Kohat.

They are for the most part a pastoral people. In the hot summer months they retire with their cattle to the mountains, inhabiting tracts varying from 4,000 to 10,000 feet above the sea. In the winter they descend into the Derajat, and the plains become dotted with their herds and flocks, and with their black blanket tents pitched in groups like villages, and moved from place to place according to their necessities for forage and water.

No. 132. Mahsood Wuzeerees.

The present photograph shows three members of the Mahsood division of the Wuzeerees, who do not differ from the others in any essential respect. They are armed with sword and shield, which appears to be the favourite equipment among them.

PHOTOGRAPHS OF INDIAN ARCHITECTURE

FROM

THE INDIA MUSEUM, LONDON.

SELECTED AND ARRANGED BY JAMES FERGUSSON, D.C.L., F.R.S.

(Frames 1 to 264.)

ANCIENT SCULPTURE.

The first 24 frames in this collection (1 to 24) contain a selection of examples of Indian sculpture from the earliest times till the art ceased to be original. They are not arranged in exact chronological order, but in groups, which, with the dates attached, are, it is hoped, sufficient to render the principal characteristics intelligible.

The first and second frames are occupied principally with examples from the neighbourhood of Peshawur and Muttra bearing strongly the impress of the Greek art of Bactria, which so far as we now know originated the art of stone figure sculpture in India.

Frame No. 3 contains sculpture from the Buddhist tope at Sarnath, dating from the 4th to 8th century A.D., and frame 4 various sculptures from the Museum of the Asiatic Society in Calcutta.

1. Indo-Bactrian Sculptures. From the neighbourhood of Peshawur.

2. Silenus or Bacchus. Found at Mathura.
   Silenus or Bacchus. Found at Mathura.
   Statue of Buddha.
   Statue of Maya Devi.
   Lower half of female figure From Mathura.
   Sculptured pillar. From Mathura.
   Worship of Buddha.
   From Surveyor's-General Office, Calcutta.

3. Statue of Buddha. From Sarnath, Benares.
   Statue of Padma Pani.
   Sculptures representing scenes in the life of Buddha. From Sarnath, Benares.
   Sculptures representing scenes in the life of Buddha. From Sarnath, Benares.
   Statue of Buddha. From Sarnath, Benares.
   Statue of Buddha. From Sarnath, Benares.
   From Surveyor's-General Office, Calcutta.

4. Vamana outwitting Bali.
   Snake God and Goddess.
   Ornamental figures. From Cuttack.
   Figure of Buddha attaining Nirvana.
   Figure of Maya asleep.
   From Surveyor's-General Office, Calcutta.

The Buddhist caves at Udayagiri date from about two centuries B.C. to probably 200 to 250 years after our era, and are remarkable for the boldness and freedom with which their sculptures are executed. From the friable nature of the stone in which they are carved, they are unfortunately so much corroded that it is difficult to make out the subjects. They generally appear to refer to local legends, interspersed with scenes of hunting, dancing, and social enjoyments, which are characteristic of Buddhist sculpture of that period.

5. Sculptures. From the caves at Udayagiri.
   From Surveyor's-General Office, Calcutta.

6. Ornament resembling a Greek Patera. Ganesha Cave, Udayagiri.
   Booted figure. From the Rani Cave, Udayagiri.
   Portion of a frieze. Lower Verandah, Rani Cave, Udayagiri.
   First portion of a frieze. Upper Verandah, Rani Cave, Udayagiri.
   End of frieze. Upper Verandah, Rani Cave, Udayagiri.
   Portion of frieze. Lower Verandah, Rani Cave, Udayagiri.
   Wall carving. From the Rani Cave, Udayagiri.
   Sixth portion of frieze. Upper Verandah, Rani Cave, Udayagiri.

Photographed from casts taken by H. H. Locke Superintendent of School of Design, Calcutta.

Frames 7, 8, and 9 contain examples of Buddhist sculpture in Behar, none, however, of any great antiquity. Those here exhibited range from the 4th to the 10th century.

7. Large figure of Buddha. Buragaon.
   Figure of Sakya Singha. Kurkihar.
   Gigantic statue in the temple.
   Two Buddhist figures. Konch.
   Two Buddhist figures. Gya.
   Large figure of Budh. Buragaon.
   By T. F. Peppe.

8. Figure of Buddhisatva Avalokiteswara. Dharawut.
   Figure of Mahamaya. Simroun.

Buddhist figure. Konch.
A beautifully carved figure. Chilllor.
A prince on horseback. Dapthu.
By T. F. Peppe.

9. A beautifully carved figure. Simroun.
Large figure of Surya. Simroun.
Fine statue of Sakya Singha. Kispa.
Fine statue of Sakya Singha. Kispa.
Large figure of Budh. Buragaon.
Fine statue of Buddha. Genjan.
By T. F. Peppe.

Jajpore on the Byturni river, was at various periods, from the 7th century downwards, the residence of the sovereigns of Orissa. The sculptures in these three frames, except the two first, however, appear to belong to the 12th to 14th centuries, but as the building which they once adorned was destroyed by the Mahomedans, it is not easy to feel certain as to their date.

10. The Virgin Goddess. Vellore Pagoda.
Sculptured capital. Kirwuttee.
Indrani. Jajpore, in Cuttack.
Indrani. Jajpore.

11. Chamunda. Jajpore.
Upper portion of colossal figure. Jajpore.
Colossal figure. Jajpore.

12. Image of Garuda. Near Jajpore.
Lath. Near Jajpore.
Figure from the Beroja Temple. Jajpore.
Varahi. Jajpore.

The following six frames (13 to 18) contain examples of sculpture from all parts of India, and of all ages except the most ancient. Though none of them individually are of the highest class, they together form a good illustration of the mode in which sculpture was applied by the Indians, and a fair representation of its average merits.

13. Window of perforated stone. Nursapoor.
Window of perforated stone. Nursapoor.
The Great Temple. Sanctuary of the Pavilion.
Hullabeed. Mysore. *By Dr. Pigou.*

14. Shravana Bala Gola in Mysore. The great Jain statue. *By Captain Lyon.*
Carved stone figures at Mahavellipooram.
Carved stone figures at Mahavellipooram.
Panel. Elephanta Cave. *By Bombay Photo. Co.*
Group of Mahadeo and Purwutty in the Dhumar Lena. Elora. *By Bourne and Shepherd.*

15. Group of monkeys carved in stone. Mahavellipooram, near Madras.
Gunesh, the God of Wisdom. Mysore. *By Dr. Pigou.*
Group of elephants. Mahavellipooram.
Figure of Nara Singha. From Hullabeed.
The Hunooman at Beejanuggur. *By A. C. B. Neill.*

16. Ruined temple of Hallabeed. The great stone bull. *By Captain Lyon.*
Colossal bull at Chamoondee. Mysore.
Colossal bull at the French rocks. Mysore. *By Dr. Pigou.*

17. Idol car with stone wheels. Bunshunkuree. *By Col. Biggs.*
Idol car at Chamoondee. Mysore.
Idol car. Seringapatam. *By Dr. Pigou.*

18. A memorial stone. Hungul.
Two sculptured memorial stones. Hungul.
Sculptured memorial stone. Hungul.
By Dr. Pigou.

19 and 20 are devoted to the illustration of the sculptures of the Sanchi Tope, and are selections from the plates of the work on Tree and Serpent Worship, published at the expense of the Indian Government by the author. The Tope itself probably dates from 250 B.C. The sculptures of the gateways here illustrated appear all to belong to the first century of our era.

This Tope is situated near Bilsah in the native state of Bhopal in Central India.

19. Front view of eastern gateway. Sanchi.
Front view of northern gateway. Sanchi.
Eastern view of Tope. Sanchi.
Northern view of Tope. Sanchi.
Photo. by Lieut. Waterhouse.

20. Rear view of northern gateway. Sanchi.
Rear view of eastern gateway. Sanchi.
Ruins of western gateway. Sanchi.
Ruins of western gateway. Sanchi.
Chaitya Hall. Sanchi.
Sculptures on eastern gateway. Sanchi.
Ruins of Vihara. Sanchi.
Photo. by Lieut. Waterhouse

21 to 24 are illustrations of the Amravati Tope, and are likewise selections from the plates of the work on Tree and Serpent Worship. They belong principally to the 4th century of our era; a few may be a century older, and some extend down to about the year 500.

Amravati is situated on the banks of the river Kistnah about 70 miles from its mouth, in the Madras presidency.

21. Elevation of external face of outer enclosure. Amravati.
Elevation of internal face of outer enclosure.
Elevation of internal faces of two pillars of outer enclosure. Amravati.
Elevation of internal faces of two pillars of outer enclosure. Amravati.
Elevation of internal faces of two pillars of outer enclosure. Amravati.
Fragments of internal frieze of outer enclosure. Amravati.
Fragments of internal friezes of outer enclosure. Amravati. *Photo. by W. Griggs.*

22. Amravati tope. Bas-relief representations of the Tope itself from the sculptures of the inner enclosure. *By W. Griggs.*

23. Fragments of sculptures. Amravati. *By W. Griggs.*
Fragments of sculptures. Amravati. *By W. Griggs.*
Restoration of a portion of inner enclosure. Amravati. *By W. Griggs.*

24. Amravati Tope. Bas-relief representations of the Tope itself from the sculptures of the inner enclosure. *By W. Griggs.*

ROCK-CUT TEMPLES.

The next thirty frames (25 to 54) are devoted to the Rock-cut or Monolithic architecture of India.

25 contains illustrations of the Behar group which are the oldest series of artificial caves in India. They date from the time of Asoka, 250 B.C., and are all comprehended probably within a century from that time. 26 contains illustrations of the Cuttack Caves, which is the only other extensive group known to exist in Eastern India, and in date succeeded those last mentioned. Some of the sculptures in this series of caves have already been exhibited in frames 5 and 6.

25. The Vadithi-ka-Kubha Cave. Burrabur.
The Karna Chopar Cave. Burrabur.
The Vapiya-ka-Kubha Cave. Burrabur.
The Lomas Rishi Cave. Burrabur.
The Sudama Cave. Burrabur. *By T. F. Peppe.*

26. The palace of Rajah Lalat Indra Kesari. Left view. Udayagiri, Orissa.
The Ganesa cave. Udayagiri, Orissa.
The palace of Rajah Lalat Indra Kesari. Right view. Udayagiri, Orissa. *By Col. H. Dixon.*

The caves illustrated in frame 27 in like manner begin the history of cave architecture in Western India. The first, near Bersa, may be 200 years B.C. and Bhaja 100. The great cave at Karlee (28 and 29) was almost certainly excavated by King Devabhuti about the year 87 B.C., and is beyond all doubt the finest Chaitya cave in India. As will be observed all three retain a good deal of the woodwork with which they were originally adorned, and the earliest (Bersa) has the sloping pillars and all the details of a wooden erection. The front was entirely in wood and has consequently disappeared, though the great frame-work that originally adorned that at Karlee as still in situ.

27. Pillar of the portico. Bersa.
Front. Bersa.
Interior of the Chaitya. Bhaja.
Cave on the right of the Chaitya. Bhaja.

28. Karlee caves, exterior.
Karlee caves, entrance.
Karlee caves. Karlee.
Karlee caves. Karlee. *By Bombay Photo. Co.*

29. View of cave from over entrance. Karlee.
Interior of cave. Karlee.
Carvings on the face of the rock. Karlee.
By Bombay Photo. Co.

The Nassick series is one of the most interesting in India. It is wholly Buddhist, and the dates of its caves extend from Nahapana in the first century B.C. to Yadnya Srî about 400 A.D. Some of the details of these façades are remarkable for their elegance.

30. Cave. Nassick.
Cave. Nassick.
Cave. Nassick. *By Bombay Photo. Co.*

31. Cave. Nassick.
Cave. Nassick.
Cave Pandu Lena. Nassick. *By Bombay Photo. Co.*

32. Interior of cave at Nassick.
Sculptures in a cave at Nassick.
Cave. Nassick. *By Bombay Photo. Co.*

Taken altogether the Ajunta series is perhaps the most complete and interesting of all the Buddhist groups in India. The caves found in this wild and romantic valley extend in date from the 1st century B.C. to the 8th century A.D., and besides the great variety and richness of the sculptures retain to a great extent the fresco paintings with which all these caves appear once to have been adorned. Except, however, at Ajunta and Baugh only the faintest traces of this mode of decoration are now to be found anywhere.

33. Interior of a cave No. 9. Ajunta.
The front of cave No. 26. Ajunta.
Broken pillars in the verandah of cave No. 24. Ajunta. *By Bourne and Shepherd.*

34. View of verandah of cave 1, looking north. Ajunta.
Carved pillars in the verandah of cave No. 2. Ajunta.
South end of verandah of cave No. 1. Ajunta. *By Bourne and Shepherd.*

35. Figures to the right of cave No. 10. Ajunta.
Figures on the front of cave No. 4. Ajunta.
View in the verandah of cave No. 26. Ajunta. *By Bourne and Shepherd.*

The Elora series of caves (Nos. 36 to 45) is the most extensive as well as the best known group of caves in India, but it is also one of the most modern. It begins on the south with a small group of Buddhist caves, the Dehrwarra and Vishwacarma, excavated at the end of the 7th or beginning of the 8th century. Beyond these is a very extensive group of Hindu excavations, extending down to the 10th or 11th, and including the well-known Kailas. To these succeed at the northern end of the series, the Jaina group (frames 43, 44, and 45) some of whose dates India may extend into the 13th century.

The first three, from 36 to 38, are devoted to the Kailas, the pride of Elora,—and its adjuncts. Strange to say the style of its architecture is not that of the north of India, but certainly borrowed from the south, and there is strong evidence to prove that it owes its origin to the Cheras and Cholas of the south, who—8th or 9th centuries—conquered the whole of western India up to the Nerbudda.

The other Hindu caves are more remarkable for the beauty of their sculpture than the grandeur of their architecture, with the one exception of the Dhumar Lena, which is the counterpart of that at Elephanta, and of about the same date.

36. The cave of Lunka adjoining the Kailas. Elora.
The scarp of the south colonnade, Kailas. Elora.
The scarp of the south colonnade. View of the other half. Elora. *By G. F. Lafond.*

37. Exterior of the cave of Kailas. Elora.
Exterior of the cave of Kailas. View north.
The renowned fortress of Dowlutabad. Elora. *By Bourne and Shepherd.*
Exterior of the caves of Kailas. View north. Elora. *By G. F. Lafond.*

38. South view of the Kailas Pagoda. Elora.
View south. Elora.
View north of the pagoda entrance. Elora. *By G. F. Lafond*

39. Sculpture of Lukshmi bathing. Elora.
Entrance south to upper story. Elora.
View north-east of the small pagoda. Elora. *By G. F. Lafond.*

40. View north. Elora.
View south. Elora.
Entrance north to the upper story. Elora.
By G. F. Lafond.

41. The cave of Ramishwar, or Lord of Rama. Elora.
Interior of the Dhumar Lena. Elora.
By Bourne and Shepherd.
Cave with the sculpture of Shiva and Parvati. Elora.

42. Cave with sculpture of Shiva as Virabhadra. Elora.
Ceremony before the nuptials of Shiva and Parvati. Elora.
Marriage ceremony of Shiva and Parvati. Elora.
By G. F. Lafond.

43. Indrani, the wife of Indra. Elora.
Indra, the God of the Air and of the Heavens. Elora.
The exterior of Indra's Cave. Elora.
By G. E. Lafond.

44. Exterior of the Indra Subha. Elora.
Exterior of the Jugnath Subha. Elora.
Interior of the Indra Subha. Elora.
By Bourne and Shepherd.

45. Exterior of Pursooramah's Cave. Elora.
Interior of the Cave of Juggannath. Elora.
Interior of the Cave of Juggannath. Elora.
By G. F. Lafond.

The Elephanta Cave in Bombay Harbour was the one first known to Europeans, and is from its situation the one most frequently visited and described. Like its counterpart the Dhumar Lena at Elora it belongs to the 8th or 9th, it may even extend into the 10th century of our era.

46. Elephanta Cave, the chamber. Bombay.
Elephanta Tiger Cave.
Elephanta Cave, entrance.
By Bombay Photo. Co.

47. Elephanta Cave.
Elephanta Cave.
Interior of Elephanta Cave. *By Bombay Photo. Co.*

48. Elephanta Caves, panel. Bombay.
Elephanta Caves, panel representing the marriage of Shiva.
Interior of Elephanta Cave, No. 2.
By Bombay Photo. Co.

DRAVIDIAN ARCHITECTURE.

The following 70 frames (49 to 120) are devoted to the style of architecture peculiar to the Dravidian or Tamul speaking races of the south of India, and is easily distinguishable from either the Buddhist or Jaina styles, or the contemporary architecture of northern India. The Temples or Vimanas are always straight-lined pyramids elevated on lofty bases. The upper or sloping part is always divided in separate storeys, and adorned with what appears to be reminiscences of cells. Another very remarkable feature is the Gopura or gateways which are generally higher and always more numerous than the temples, and are divided like the temple into from 3 to 13 storeys. The temples always terminate upwards in a polygonal dome, the gopuras in an oblong curvilinear roof.

No known specimen of Dravidian architecture can claim an authentic date extending beyond the 8th century of our era, but the style was continued and reached its culminating point of magnificence just before the time when our occupation of the country gave a death blow to its indigenous arts.

The first 6 frames (49 to 54), though properly classed under Dravidian architecture, also belong to the Rock-cut series. They are both. The five Raths, as they are called, illustrated in frames 49 to 51, are as remarkable as anything of their class in India. They seem all of the same age, and, like everything else at this place, were left unfinished. It is, however, extremely difficult to determine what their age really is. Some caves at this place may be older, but the Raths and all the principal bassi-relievi seem subsequent to the year 1000 and may extend to 1100 or 1200. They certainly appear to be more modern than the Hindu caves at Elora, though strange to say the Kailas is in the same style as these, though differing entirely from the intermediate contemporary examples.

One of the most remarkable objects at Mahavellipore is the great bas-relief (frame 52) extending 90 feet north and south, on two great granite boulders, or masses. It is wholly devoted to serpent worship, though only the tail of the great Nâga is to be seen in the crack between the two rocks. His wife and all his attendants are Nâgas, and are still in situ, and the upper part of his body has recently been excavated from the sand in which it was buried when the photographs were taken. All the figures of men and animals are tending from the right and left towards this now dethroned divinity.

49. The fourth monolith. Mahavellipore, near Madras.
General view of the monoliths from the S. W. Mahavellipore.
The fifth monolith. Mahavellipore.
By Captain Lyon.

50. Another view of the cracked monolith. Mahavellipore.
The cracked monolith. Mahavellipore.
The first and second monolith. Mahavellipore. *By Captain Lyon.*

51. The first monolith. Mahavellipore.
View of monolithic temples. Mahavellipore.
Small monolithic temple. Mahavellipore.
By Captain Lyon.

52. Porch adjoining the basso-relievos. Mahavellipore.

Basso-relievo in continuation. Mahavellipore.
Basso-relievo on the face of granite rocks. Mahavellipore, near Madras. *By Captain Lyon.*

53. Basso-relievo on left wall of temple. Mahavellipore.
Basso-relievo on right wall of temple. Mahavellipore.
Basso-relievo on left side of temple. Mahavellipore. *By Captain Lyon.*

54. General view of granite rocks. Mahavellipore.
Basso-relievo on right side of temple.
Structural temple on the sea shore. Mahavellipore.
By Captain Lyon.

The Seringham Pagoda, frames 55 to 57, is one of the largest and most magnificent in the south of India, but is not old. Its Vimana or sanctuary is insignificant in dimensions and poor in ornament, but its seven enclosures with their Gopuras increasing in size and magnificence as they recede from the centre are unsurpassed by any temple in the south. Had its entrance gateway (55) been completed it would have been the largest in India. Its door posts being single blocks of granite 40 feet in height, and the other parts in proportion. Its building was interrupted by the wars of the French and English for the possession of the Rock of Trichinopoly, in the middle of the last century.

The Seringham Pagoda is dedicated to Vishnu, but within a mile of it stands the Jumbookeshwar temple (58) dedicated to Shiva. Though not so large it is older, more uniform in style, and altogether a finer temple than its better known rival.

55. Seringham Pagoda, gateway at entrance, near Trichinopoly.
Seringham Pagoda, the horse court.
Seringham Pagoda, pyramidal gateway.
Seringham Pagoda, the horse court.
By Captain Lyon.

56. The Rock of Trichinopoly.
Seringham Pagoda, the south entrance. Near Trichinopoly.
Seringham Pagoda, general view.
By Captain Lyon.

57. Seringham Pagoda. The Hall of One Thousand Columns.
Seringham Pagoda. Small gateway on east side.
Seringham Pagoda. East side of the largest gateway.
Seringham Pagoda. East side of gateway.
Seringham Pagoda. West side of gateway.
By Captain Lyon.

58. Jumbookeshwar Temple. The tank and surrounding objects. Near Trichinopoly.
Jumbookeshwar Temple. *By Captain Lyon.*

The next seven frames are dedicated to one of the most characteristic buildings in the south of India. It was erected by Trimul Naik, one of the sovereigns of Madura, who reigned A.D. 1633–1663.

It is a great three aisled hall, 333 feet long by 81 wide, but is more remarkable for the extent and elaborateness of its sculptures than for its dimensions. Besides, portraits of the founder and his family, it contains representations of all the favourite gods of the Hindu Pantheon. The rival sects of Siva and Vishnu being almost equally prominent, and appearing in all their various manifestations.

59. Trimul Naik's portico. Unfinished base of gateway at east side. Madura.
Trimul Naik's portico. Two monolithic pillars at east entrance.
Trimul Naik's portico. Carvings on base of unfinished gateway. *By Captain Lyon.*

60. Pillar in Trimul Naik's portico. Figure of watchman on right of entrance. Madura.
Figure in Trimul Naik's portico. The God and the Little Pigs.
Pillar in Trimul Naik's portico. Figure of watchman on left of entrance.
Figure in Trimul Naik's portico. Figure with pig's head. *By Captain Lyon.*

61. Trimul Naik's portico, interior from east entrance.
Figure in Trimul Naik's portico. The Goddess.
Figure in Trimul Naik's portico, Shiva.
By Captain Lyon.

62. Trimul Naik's portico, pillars on north side.
Trimul Naik's portico, interior from west end.
Trimul Naik's portico, the side aisle.
By Captain Lyon.

63. Trimul Naik's portico. Pillars on south side.
Trimul Naik's portico. Pillar at N. W. corner of building.
Handsome pillar in Trimul Naik's portico.
By Captain Lyon.

64. Pillar in Trimul Naik's portico. Shiva.
Pillar in Trimul Naik's portico. Shiva feeding an elephant.
Pillar in Trimul Naik's portico. Vishnu.
Pillar in Trimul Naik's portico. Figure praying. *By Captain Lyon.*

65. Trimul Naik's portico. The west front.
Trimul Naik's portico. Pillar at S. W. corner of building.
Pillar in Trimul Naik's portico.
By Captain Lyon.

All the principal parts of the great Pagoda at Madura (66 to 72) belong to the same age as the hall of Trimul Naik. There may be some sanctuary of older date, but it is insignificant. The gateways are in some respects as beautiful as any in the south, but like Seringham it wants the harmonizing effect of a central dominant object.

66. Pillar in Trimul Naik's portico. The marriage ceremony.
The Great Pagoda. The pyramidal tower at south entrance. Madura.
The Great Pagoda, The pyramidal tower at east entrance. *By Captain Lyon.*

67. The Great Pagoda. Inner tower at entrance to sanctum.
The Great Pagoda. The pyramidal tower at west entrance.
The Great Pagoda, interior of porch.
The Great Pagoda, the porch at entrance.
By Captain Lyon.

68. The Great Pagoda, the golden lotus tank.
The Great Pagoda, carved figure on right near the entrance.
The Great Pagoda, carved pillar near the entrance. *By Captain Lyon.*

69. The Great Pagoda, pillar and frescos on wall.
The Great Pagoda, another view of the golden lotus tank. *By Captain Lyon.*

70. The Great Pagoda, carved pillar in the Thousand Pillar portico.
The Great Pagoda, the Yali.
The Great Pagoda, carved pillar in portico, near the tank. *By Captain Lyon.*

71. The Great Pagoda, carved pillars in the Thousand Pillar portico. *By Captain Lyon.*

72. The Great Pagoda, carved pillar in the Thousand Pillar portico. *By Captain Lyon.*

The Palace at Madura and tank at Secundermali (73 to 76), owe their splendour to the same munificent monarch. Being secular buildings, however, they betray the influence of the arched style which the Mahomedans had introduced into India. These forms were never admitted in temples, or sacred buildings of any sort, but led to many combinations of extreme picturesqueness in palaces and buildings devoted to secular purposes.

73. Madura Palace, S.E. angle of the quadrangle.
Madura Palace, view of front.
Madura Palace. General view from outside the walls. *By Captain Lyon.*

74. Madura Palace, view from interior looking out.
Madura Palace, the interior.
Madura Palace, view of the side aisle.
Madura Palace, north side of quadrangle. *By Captain Lyon.*

75. Another view of the sacred tank. Madura.
The interior of the Tuncum. Madura.
The sacred tank. Madura. *B Captain Lyon.*

76. The rock and tank. Secundermalie, near Madura.
Front of entrance porch. Secundermalie.
Interior of the entrance porch. Secundermalie. *By Captain Lyon.*

The following six frames (77 to 82) contain a few representations of the ordinary temple architecture of the south of India. The most remarkable example is the unfinished rock-cut temple at Haloogoomulla. In style it very much resembles the Kailas at Elora, and may be of the same age, 9th or 10th century. It was evidently intended to mark the triumph of the religion of Siva over that of Jina, to which the rock sculptures (78 and 79) were dedicated. As the Kailas represented the same victory over the Buddhists, as shown in the Dherwarrah and Vishwacarma caves.

The four statues in the Tinnevelly Pagoda (81) are very remarkable specimens of Hindu art. They are cut in the hardest basalt which no ordinary tool can scratch.

77. The large pyramidal tower at entrance. Streevelliputtur.
Carvings on stone base of tower. Streevelliputtur.
The large Juggernaut car. Streevelliputtur.
Another view of large Juggernaut car. *By Captain Lyon.*

78. Tank and portion of old temple. Streevelliputtur.
The rock and sacred tank. Kaloogoomulla.
Carvings on upper part of the rock. Kaloogoomulla. *By Captain Lyon.*

79. Another portion of carvings on the rock. Kaloogoomulla.
Other carvings on the rock. Kaloogoomulla.
View of rock out of which temple is cut. Kaloogoomulla. *By Captain Lyon.*

80. The beautiful monolith. Kaloogoomulla.
A more detailed view of the monolith. *By Captain Lyon.*

81. Tinnevelly Pagoda. The tank and surrounding objects.
Tinnevelly Pagoda. The entrance gateway.
Carved pillar in Tinnevelly Pagoda. Colossal figure of Kuman.
Carved pillar in Tinnevelly Pagoda. Colossal figure of Verrabadrum.
Carved pillar in Tinnevelly Pagoda. Colossal figure of Pagade.
Carved pillar in Tinnevelly Pagoda. Colossal figure of Argunan. *By Captain Lyon.*

82. Tritchindoor Pagoda. Distant view.
Tritchindoor Pagoda. Carvings on base of tower.
Tritchindoor Pagoda. Section of old door under great tower.
Tritchindoor Pagoda. The great pyramidal tower over gateway. *By Captain Lyon.*

The Pagoda in the island of Ramisseram, between Ceylon and the mainland, is one of the most remarkable in the south, not for its Vimana, for that is comparatively insignificant, nor yet for its Gopuras, though these are elegant and of considerable magnitude, but for its long drawn aisles. A double range of these, one within the other, encloses the central space. Some of them extend to 700 feet in a direct line, and the whole aggregate upwards of 4,000 feet. Their age is slightly anterior to that of Trimul Naik's Choultry, and some parts of the temple,—the Vimana, for instance,—may date from the 13th or 14th century. Latterly, as may be seen from the photographs, they have been frightfully disfigured by whitewash, and bedaubed with paint in the vulgarest possible taste.

83. Ramisseram Pagoda, island of Paumben. Pyramidal gateway at west entrance.
Ramisseram Pagoda. The east entrance.
Ramisseram Pagoda. Entrance passage as seen from west gateway. *By Captain Lyon.*

84. Ramisseram Pagoda. Carved pillar in centre corridor.
Ramisseram Pagoda. Carved pillar in centre corridor.
Ramisseram Pagoda. Carved pillar in centre corridor.

Ramisseram Pagoda. Carved pillar in centre corridor.
Ramisseram Pagoda. Carved pillar in centre corridor. *By Captain Lyon.*

85. Ramisseram Pagoda, island of Paumben. The old temple in garden.
Ramisseram Pagoda. The long side aisle.
Ramisseram Pagoda. Inner half of the west entrance passage. *By Captain Lyon.*

Avadea Covill is one of the most beautiful, as well as one of the oldest temples in the south of India. It is all built of a stone so hard and compact that the great cornice, of double curvature, of the porch, is only half an inch in thickness; but every detail of this building is finished with an elaborateness unsurpassed in the country. The whole is probably anterior to the year 1000 A.D.

86. Calliar Covill. The small gateway.
Calliar Covill. General view of the inner court.
Calliar Covill. The two entrance gateways. *By Captain Lyon.*

87. The tank and temple. Tircoostioor.
Side entrance to temple. Tircoostioor. *By Captain Lyon.*

88. Carved pillar in front of porch. Avadea Covill.
Tower over the entrance.
Interior of porch at entrance.
Carved pillar in front of porch.
Carved pillar in front of porch. *By Captain Lyon.*

89. Pyramidal gateway at porch. Avadea Covill.
Carved pillar in front of porch.
Carved pillar in front of porch.
Carved pillar in front of porch.
Carved pillar in front of porch.
Carved pillar inside porch.
Carved pillar inside porch. *By Captain Lyon.*

90. View of the palace. Poodoocottah.
Another view of a portion of palace. Poodoocottah.
Tanjore Pagoda. General view from outside the fort. *By Captain Lyon.*

The Temple at Tanjore is one of the few in the south where the Vimana or temple itself is the principal object, and is in correct proportion to the Gopuras and other subordinate parts. In consequence of this, when seen from the outside, it is one of the most imposing of southern temples.

The Palace at Tanjore is one of the most modern, and though picturesque, is characterised by the vulgarity of Mahratta taste.

91. Tanjore Pagoda. Pyramidal gateway at entrance to inner court.
Tanjore Pagoda. The pyramidal gateway at entrance.
Tanjore Pagoda. View taken from S. E. corner of inner court.
Tanjore Pagoda. General view of inner court. *By Captain Lyon.*

92. Tanjore Pagoda. The big bull.
Tanjore Pagoda. The great pyramidal tower.
Tanjore Pagoda. View of the porch with the big bull. *By Captain Lyon.*

93. Tanjore Pagoda, the great pyramidal tower. Façade of base on west side.
Tanjore Pagoda, the great pyramidal tower. Façade of base on north side.
Tanjore Pagoda. The Subramanya temple. *By Captain Lyon.*

94. Tanjore Pagoda. Another view of the Subramanya temple.
Tanjore Pagoda, the Subramanya temple. Detail of south façade.
Tanjore Pagoda, the Subramanya temple. Detail of west façade. *By Captain Lyon.*

95. Tanjore Pagoda, the Subramanya temple. North façade and stone trough.
Tanjore Pagoda, Small temple near the Subramanya.
Tanjore Pagoda, the great pyramidal tower Detail of base on south side. *By Captain Lyon.*

96. Tanjore Palace. Carvings on front of the audience chamber.
Tanjore Palace. Carvings on the north side of the quadrangle,
Tanjore Palace. View from the street. *By Captain Lyon.*

97. Tanjore Palace. Curious pyramidal tower.
Tanjore Palace. Disused council chamber.
Tanjore Palace. Another view of the disused council chamber. *By Captain Lyon.*

The temple at Peroor has no central object, but is remarkable for the beauty of its sculptures, which, however, are comparatively modern; the oldest of them can hardly be dated earlier than the early part of the 17th century, and they extend into the last.

98. Peroor Temple, near Coimbatore. Beautiful monolith outside the court.
Peroor Temple. View of the two pillars.
Peroor Temple. General view. *By Captain Lyon.*

99. Peroor Temple. Carved pillar in detail.
Peroor Temple. Third carved pillar in centre aisle.
Peroor Temple. Sixth carved pillar in centre aisle.
Peroor Temple. Fifth carved pillar in centre aisle.
Peroor Temple. Fourth carved pillar in centre aisle. *By Captain Lyon.*

10. Peroor Temple. Seventh carved pillar in centre aisle.
Peroor Temple. Eighth carved pillar in centre aisle.
Peroor Temple. Ninth carved pillar in centre aisle.
Peroor Temple. Tenth carved pillar in centre aisle.
Peroor Temple. Reverse side of pillar, No.421. *By Captain Lyon.*

On the overthrow of the Great Chalukya dynasty of the Mysore by the Mahomedans in 1310, and that of Warangul in 1334, the city and dynasty of Vijia-nuggur rose into importance, and for more than two centuries held its own against the powerful Mahomedan state of Beejapore, till it was finally taken and sacked in 1565.

During this period it was adorned with temples and especially with palaces, which in their ruins are unsurpassed by those of any of the old Hindu capitals of India. Frames 101 to 111 hardly suffice to convey an adequate impression of their beauty or extent.

As will be observed, most of the civil buildings betray the influence of the arched style of the Mahomedans, though seldom using true arches. The sacred edifices, however, are quite free from any trace of foreign influence.

The most remarkable group is that of the great granite porticoes and stone car, contained in the three last frames (109 to 111). For elaborateness of carving, and difficulty of execution, they are unsurpassed by anything in India.

101. Ruins of Vijianuggur, near Calamapoor. The elephant stables.
Ruins of Vijianuggur. The hall of justice and treasury.
Ruins of Vijianuggur. The wall of the harem and tower. *By Captain Lyon.*

102. Ruins of Vijianuggur, near Calamapoor. Ruins of the harem.
Ruins of Vijianuggur. The wall to the north of the harem.
Ruins of Vijianuggur. General view of ruins. *By Captain Lyon.*

103. Ruins of Vijianuggur, near Calamapoor. A small ruined temple, the entrance porch.
Ruins of Vijianuggur. Small ruined temple, carvings on north face.
Ruins of Vijianuggur. A small ruined temple, the northern face. *By Captain Lyon.*

104. Ruins of Vijianuggur, near Calamapoor. A small ruined temple, sides of the sanctum.
Ruins of Vijianuggur. Carvings in detail of small temple.
Ruins of Vijianuggur. Small temple, carvings on the inside wall. *By Captain Lyon.*

105. Ruins of Vijianuggur, near Calamapoor. Small temple, carvings on the outside wall.
Ruins of Vijianuggur. Large monolithic trough.
Ruins of Vijiannuggur. A tower in ruins. *By Captain Lyon.*

106. Ruins of Vijianuggur, near Calamapoor. Ruins to the right of the Humpee road.
Ruins of Vijianuggur, near Calamapoor. A portion of the washerman's bungalow.
Ruins of Vijianuggur, near Humpee. Old temple in ruins. *By Captain Lyon.*

107. Ruins of Vijianuggur, near Humpee. General view of ruined porches.
Ruins of Vijianuggur, near Humpee. Tank and surrounding objects.
Ruins of Vijianuggur, near Humpee. Street of porticoes. *By Captain Lyon.*

108. Ruins of Vijianuggur, near Humpee. General view of conical temple on hill.
Ruins of Vijianuggur, near Humpee. Detail of conical temples.
Ruins of Vijianuggur, near Humpee. Ruins of one of the old city gates. *By Captain Lyon.*

109. Ruins of Vijianuggur, near Humpee. Tower and porticoes at entrance.
Ruins of Vijianuggur, near Humpee. General view of enclosure from entrance.
Ruins of Vijianuggur, near Humpee. The large temple. *By Captain Lyon.*

110. Ruins of Vijianuggur, near Humpee. Interior of the large temple.
Ruins of Vijianuggur, near Humpee. Another view of interior of large temple.
Ruins of Vijianuggur, near Humpee. Another view of the large temple. *By Captain Lyon.*

111. Ruins of Vijianuggur, near Humpee. The stone car.
Ruins of Vijianuggur, near Humpee. The small temple.
Ruins of Vijianuggur, near Humpee. General view of the stone car. *By Captain Lyon.*

The gateways of Tarputry are, perhaps, the most exquisite specimens of carving applied to this purpose in the south of India. They are unfinished, but are said to have been erected by Krishna Deva, King of Vijianuggur, in or about 1524; and there seems no reason for doubting the correctness of the date thus assigned to them.

112. Temple in ruins near the river. Tarputry.
The new temple, stone car, and porches around. Tarputry.
The new temple, carvings on base of temple. Tarputry. *By Captain Lyon.*

113. Temple in ruins near the river. Tarputry.
Temple in ruins near the river. Tarputry.
Temple in ruins near the river. Tarputry.
Temple in ruins near the river, Tarputry. *By Captain Lyon.*

114. Temple in ruins near the river. Tarputry.
Temple in ruins near the river. Tarputry.
Temple in ruins near the river. Tarputry. *By Captain Lyon.*

115. Carved stone pillar. Vellore Pagoda.
Ornamental stone pillars. Vellore Pagoda.
Stone carvings on the basement of Vellore Pagoda.

116. Carved stone pillars. Howbolhum.
Carved stone pillars. Howbolhum.
Group of pillars. Howbolhum.

117. Ruins of entrance to the pagoda. Howbolhum.
Scroll ornaments in stone. Howbolhum.
Scroll ornaments in stone. Howbolhum.

118. Carved stone pillar. Howbolhum.
Carved stone pillar. Howbolhum.
Carved stone pillar. Howbolhum.
Carved stone pillar. Howbolhum.

119. Meeralic mundapum and tank. Little Conjeveram.
Ornamental pillars in the pagoda at Little Conjeveram.
Culyana Mundapum. Big Conjeveram.

120. Carved stone pillar. Veerinjeepurum Pagoda.
Carved stone pillars. Taramungalum.
Entrance down to a tank. Veerinjeepurum.

NORTHERN HINDU ARCHITECTURE.

The three views in frame 121 are interesting as showing the northern and southern styles in juxtaposition. Purudkul in Dharwar is situated on the border line between the two architectural provinces, and apparently at the same time was occupied by Dravidians and Hindus. At all events we have here the straight-lined pyramid, with its distinctly-marked storeys, side by side with the curvilinear tower of the north, without any trace of a storeyed arrangement. As hinted above, the Dravidian style probably grew out of the many-storeyed Viharas or monasteries of the Buddhists, but we have not yet discovered the prototype of the northern styles.

121. Temples. Purudkul.
Group of temples, with idol car. Purudkul.
Two temples. Purudkul. *By Col. Biggs.*

The great temple at Bobeneswar erected in the 7th century is not only one of the oldest, but one of the finest and most complete of the class, and with the numerous temples around it, shown in cases 122 to 124, form one of the most remarkable and most extensive groups of temples in India. The great Temple of Juggernath (123) was erected in the 12th century, and is the scene of the celebrated car festival.

122. The great temple at Bobeneswar. Bobeneswar in Orissa.
Group of temples west of the great temple. Bobeneswar in Orissa.
A glade near the Mookteswar Temple. Bobeneswar in Orissa. *By Col. H. Dixon.*

123. The Temple Annuntoo Basa Davey. Bobeneswar in Orissa.
Curious tank to the east of the great temple. Bobeneswar in Orissa.
View of the Great Temple of Juggernaut. Pooree. *By Col. H. Dixon.*

124. The Boital Temple. Bobeneswar in Orissa.
The Temple Pursuram Iswar. Bobeneswar in Orissa.
The Mookteswar Temple with idols' swing. Bobeneswar in Orissa. *By Col. H. Dixon.*

Frames 125 to 127 contain examples of this style in Western India, differing slightly from those in Cuttack, but displaying the same general characteristics as those in Orissa. It is doubtful whether the temple now seen at Somnath (127) is that said to have been destroyed by Mahmoud of Guzni. Parts of that temple are probably among the ruins, but modified by subsequent alterations.

125. Very ancient temple at Byjnath. Kangra.
Stone bullocks temple at Byjnath. Kangra.
Porch of temple at Byjnath. Kangra.
By Bourne and Shepherd.

126. Temple of Surya Narayen. Girnar.
Temple of Bimanath. Girnar.
Interior of the Temple of Bimanath. Girnar.
By Bombay Photo. Co.

127. Somnath. Front. Girnar.
Somnath. Back. Girnar.
Interior of Somnath. Girnar.
By Bombay Photo. Co.

The temple of Ambernath, near Callian, in Bombay Harbour (128 to 130), is a fine specimen of this style of architecture, and if an inscription found on it is to be trusted, belongs to the 9th century. From the style, however, it is more probable that in its present form it is a century, and may be two centuries more modern.

128. Ambernath Temple, near Callian. West front. N.W. face. General view.
Ambernath Temple, near Callian. General view. East side.
Ambernath Temple, near Callian. General view of Vernanah (Vimana). N. side.
Ambernath Temple, near Callian. North porch. Looking east.
Ambernath Temple, near Callian. Porch of N.W. face. Larger scale.
By Shewshanker Narayan.

129. Ambernath Temple, near Callian. Details of basement. N.E. side of Vernanah.
Ambernath Temple, near Callian. Details of Vernanah. S.E. face.
By Shewshanker Narayan.

Ambernath Temple, near Callian. Interior of mandap. *By Bombay Photo. Co.*

130. Ambernath Temple, near Callian. North porch. General view.
Ambernath Temple, near Callian. Details of Vernanah. S.E. face.
By Shewshanker Narayan.

Abmernath Temple, near Callian. Detail. Showing figures on mandap. *By Bombay Co.*

Warungal, in the Nizam's territory, became the seat of an important Hindu dynasty in the 11th century, and in 1184 was the capital of Rudra-deva, one of the most famous sovereigns of his time. The principal buildings illustrated in these photographs (131 to 134), date from his time. None can with certainty be assumed to be older than his time, but some of these at Warungal itself, particularly the gateways in the last frame, come down very nearly to the Mahomedan conquest in 1334.

131. Carved stone at Warungal.
Ancient temple at Warungal.
Ancient temple in Warungal fort. Warungal.
Ancient temple. Warungal.
Hindoo Temple. Near Hyderabad.
By Hooper and Western.

132. Ancient fortified temple. Near Hyderabad.
Hindoo temple. Near Hyderabad.
Ruined temple at Warungal.
Ancient temple. Near Hyderabad.
Temple. Near Hyderabad.
By Hooper and Western.

133. Ancient carved stone. Warungal.
Carved pillar. Warungal.
Ruined Hindoo Temple. Warungal.
Ancient temple. Warungal.
Remains of serpent worship. Warungal.
Hindoo sculptures. Warungal.
By Hooper and Western.

134. Old carvings. Warungul.
Ruins at Warungul.
The gateway. Warungul.
Part of gateway of Hindu Temple. Warungul.
Part of gateway of Hindu Temple. Warungul.
By Hooper and Western.

The temples depicted in frames 135 to 139 are all situated near to one another in the province of Behar, but range in date through very nearly 1,000 years. The temples at Konch may be nearly as old as that at Bobeneswar, while the Vishnu-pud at Gya was erected only at the end of the last century. There is, of course, a considerable gradation of style between them, but the main features are the same throughout.

135. Large temple, upper chamber. Konch.
Large temple. Konch.
Large temple. Konch.
The Mungla Deva Temple. Gya.
By T. F. Peppe.

136. Temple built on one of the highest hills. Oomga.
View of old temple and Maharajah's palace. Deo.
Temple built on one of the highest hills. Oomga.
Temple, west view. Deo. *By T. F Peppe.*

137. Ruins of a temple. Cheon.
A pillared temple close to the road. Nair.
The Mungla Deva Temple. Gya.
The Mungla Deva Temple. Gya.
By T. F. Peppe.

138. The temple of Vishnu Pud. Gya.
The temple of Vishnu Pud. Gya.
Another view of the Vishnu Pud. Gya.
By T. F. Peppe.

139. View looking west. Gya.
View looking north. Gya.
View of the old town from the hill. Gya.
By T. F. Peppe.

The great Temple at Bindrabund is one of the most remarkable of its class. It was built by the celebrated Jey Sing of Jeypoor, at a time when Akbar's influence was so great as almost to effect a fusion between the styles of the Hindus and Mahomedans. The roof is vaulted, and the ornaments are almost identical with those in Akbar's palace at Futtehpore Sikri, to be described hereafter. The Observatory at Benares (141) is another example of the same sort. Rajah Amehti's Temple and the Sumeree Temple at Ramnuggur belong to the present century.

140. South transept of ancient Hindoo Temple. Bindrabund.
Ancient Hindoo Temple. Bindrabund.
Group of modern temples. Bindrabund.
By Bourne and Shepherd.

141. Carvings on Rajah Amehti's Temple. Benares.
Raja Jey Singh's Observatory. Benares.
The great mosque of Aurungzebe. Benares.
By Bourne and Shepherd.

142. Sumeree Temple at Ramnuggur. Benares.
Gyan Papee, or Well of Knowledge. Benares.
Sumeree Temple at Ramnuggur. Benares.
By Bourne and Shepherd.

The Nassick Temples, 143 to 145, are all modern but fine specimens of their class. The oldest of those illustrated in these frames is certainly not 200 years old, and may be less. The other considerably more modern. Yet they are four bold specimens of modern Hindu architecture.

143. Hindu Temple. Nassick.
Hindu Temple. Nassick.
Hindu Temple. Nassick.
By Bombay Photo. Co.

144. Hindu Temple at Nassick.
Hindu Temple at Nassick.
Ancient Hindu Temple. Nassick.
By Bombay Photo. Co.

145. Hindu Temples on river Godavery. Nassick.
By Col. Houghton.

General view of Temples. Nassick.
Hindu Temple. Nassick.
Hindu Temple. Nassick. *By Bombay Photo. Co.*

The Palace at Deig was the favourite residence of the Rajas of Bhurtpore when they rose to power on the ruins of the Delhi empire in the middle of the last century, and with their Tombs at Goverdhun, form, perhaps, the most pleasing architectural group to be found in India of so modern a date. All its features may be traced back to the Mahomedan styles, but with very considerable modifications, though it cannot be said these were always improvements.

The tombs and temples of Scindia's family (148, 149) are also pleasing examples of the very latest form of Hindu architecture, though this remark does not apply to his palace, which betrays a European influence which has proved fatal to native art in India.

146. The Gopal Bhowun, palace and tank. Deig.
The Gopal Bhowun, palace from the garden. Deig.
Interior of the Nundh Bhowun. Deig.
By Bourne and Shepherd.

147. Cenotaph and tank. Goverdhun.
Cenotaph. Goverdhun.
Principal gate of fort. Bhurtpore.
By Bourne and Shepherd.

148. Tomb of Doulut Rao Scindia. Gwalior.
Tomb of Appa Sahib. Gwalior.
Tomb of Scindia's Mother. Gwalior.
By Major Herne.

149. Temple on the hill of Sonawul. Gwalior.
Palace and bazaar in the fort. Gwalior.
Courtyard of one of Scindia's palaces. Gwalior.
By Major Herne.

The temples and palaces of Umritsur owe their existence to the late Maharajah Rungeet Sing, and though devoid of the purity and good taste of earlier days, are still picturesque, and display a good deal of invention and appropriateness of detail. Their being mostly gilded adds very much to their splendour, though hardly in a legitimate manner.

150. Babatul Temple, flying-foxes in tree. Umritsur.
Golden temple. Umritsur.
View from palace in fort. Lahore.
By Bourne and Shepherd.

CHALUKYA ARCHITECTURE.

The Chalukya style of architecture prevailed in the Mysore, in Dharwar, and in the Hydrabad territory from the 7th to the 14th century. It has neither the distinct storeys of the Dravidian nor the curvilinear outline of the northern Hindu temples. Their pyramids are generally straight-lined, and divided by lines horizontally, but not storeys. In plan they are hardly ever square, generally polygonal, frequently star-shaped, and terminate upwards, neither in the domes of the Dravidians nor the Amalika fruit-like form of the northern Hindus, but in a roof apparently derived from some metallic form. Their great beauty, however, is in their details both architectural and statuesque, in which they are unsurpassed by any other of the Indian styles.

The six frames (151 to 156) contain a selection of minor examples of this style. That at Iwullee is the oldest known example of a structural temple on the west side of India, being apparently contemporary with that at Bobeneswar, an edifice erected in the 7th century. Its form is that of the chaitya caves, and is the only structural example known exhibiting these forms.

The Jaina Temple at Guduk (152), probably of the 10th century, may be considered a typical example of the style. It has, however, lost the metal covering which once formed its crowning ornament. The triple temple at Hurulhullee is also very characteristic of the style.

151. East front of the temple. Iwullee.
Ruined temple. From the north-east. Iwullee.
Ruined temple. From the south-east. Iwullee.
By Col. Biggs.

152. Jain Temple at Guduk.
A Jain Temple. Lukhoondee. Hungul.
The temple of Someshwur. Hurulhullee.
By Dr. Pigou.

153. A temple of Siva. Chowdanpoor.
A triple temple. Hurulhullee.
A temple. Hurulhullee. *By Dr. Pigou.*

154. A temple. Dumbul.
Doorway of a detached temple. Hungul.
Portion of a temple, enlarged. Hurulhullee.
By Dr. Pigou.

155. A temple of Siva. Chowdanpoor.
A temple. Kirwuttee.
Temple near the falls. Gokak. *By Col. Biggs.*

156. Porch of a Saivite Temple. Moongoor.
A ruined temple at Lukhmeshwur.
By Dr. Pigou.

Temple at Bailoor. Detached building in the court. *By A. C. B. Neill.*

The three temples illustrated in the 10 frames (157 to 166) are the principal and most beautiful examples of this style of architecture. They are all three situated in the Mysore country and were erected by one dynasty, that of the Bellalas between the beginning of the 11th century, and their destruction by the Mahomedans in 1310.

The first of these, that at Somnathpore, is a triple temple of great beauty of detail though small in size, and one of the few that was finished on the original plan, and stands alone.

Bailoor is much more magnificent, and consists of a large group of temples in one enclosure. The windows of the principal one, in carved stone work, that admits light to its portico, are the finest things of their class in India. They are illustrated in frames 160, 161.

The temple at Hullabeed is, however, the most magnificent of its class. It unfortunately, however, was never finished, the works being interrupted by the Mahomedan conquest. It, consequently, has no spires but only the bases of the two vimanas with which it was to be adorned. Its great beauty consists in the picturesqueness, obtained by the infinite complexity of its plan, and the beauty of its sculptures, which for boldness of relief and variety of subject, are quite unsurpassed in India. The windows of its porch though very beautiful are not equal to those at Bailoor.

157. Interior court of temple. Somnathpoor.
Interior court of temple. Somnathpoor.
Tower. Somnathpoor.
East front of temple. Somnathpoor.
Carvings on temple. Somnathpoor.

158. Bailoor Temple. Carvings on north façade. Bailoor.
Bailoor Temple. General view.
Nachyar Temple. Bailoor. *By Captain Lyon.*

159. Bailoor Temple, shrine at base of tower. Bailoor.
Bailoor Temple, carvings on west side.
Bailoor Temple, the south façade.
By Captain Lyon.

160. Bailoor Temple. The east entrance.
Bailoor Temple. The south entrance.
Bailoor Temple. Carvings in detail on the east side. *By Captain Lyon.*

161. Bailoor Temple, the east façade.
Bailoor Temple, carvings on east side.
Bailoor Temple, carvings on east side.
By Captain Lyon.

162. Ruined temple of Hallabeed, west side.
Ruined temple of Hallabeed, general view.
Ruined temple of Hallabeed, east face.
By Captain Lyon.

163. Ruined Temple of Hallabeed. A section of western face.
Ruined temple of Hallabeed. S. W. face.
Ruined temple of Hallabeed. The entrance on the east side. *By Captain Lyon.*

164. Ruined temple of Hallabeed, carvings on west face.

Ruined temple of Hallabeed, carvings on S. W. face.
Ruined temple of Hallabeed, carvings on N. W. face. *By Captain Lyon.*

165. Ruined temple of Hallabeed. Detail of carvings on base of eastern face.
Ruined temple of Hallabeed. Detail of carvings on base of eastern face.
Ruined temple of Hallabeed. Detail of carvings on west face. *By Captain Lyon.*

166. Ruined temple of Hallabeed. Detail of carvings on base of eastern face.
Ruined temple of Hallabeed. Carvings on western face.
Ruined temple of Hallabeed. Detail of carvings on base of west face. *By Captain Lyon.*

167. A temple. Hungul.
Group of temples, Beejanuggur.
A ruined temple. Lukhmeshwur. *By Dr. Pigou.*

168. Porch of a Jain Temple. Belgaum. *By Col. Biggs.*
Porch of a ruined temple. Bunkapoor.
Ruined temple and tank. Hooblee. *By Dr. Pigou.*

BUDDHIST AND JAINA ARCHITECTURE.

Besides the two great Topes illustrated in frames 19 to 24 the Buddhist buildings now remaining in India, are so few as hardly to demand a class to themselves in such a series of illustrations as this.—That of Sarnath at Benares, belonging probably to the 8th century, is really the only important one in India proper. That at Budh Gya is exceptional, and unlike anything else in India. It probably took its present form from repairs executed by the Burmese in the beginning of the 14th century.

169. Ancient Buddhist tower at Sarnath. Benares.
Floral carving on ancient Buddhist tower. Benares.
Figures carved on ancient Buddhist tower. Benares. *By Bourne and Shepherd.*

170. The great temple. Buddh Gya.
The front of the temple. Buddh Gya.
One of Asoka's pillars. Tirhut.
The great temple. Buddh Gya.
The great temple. Buddh Gya. *By T. F. Peppe.*

The colonnade at Delhi consists of Jaina pillars extremely rich in ornament, but rearranged by the Mahomedans to form the courtyard of a mosque, and it is not till we reach Mount Abu that we obtain a distinct idea of the beauty of Jaina architecture. It differs from those above described principally in the fact that the effect is generally sought to be obtained internally, not by external decoration as in the previously described styles. The temples at Dilwarrah, illustrated 172 to 174, all are in the purest white marble and range from 1025 to 1300 in date, and as interiors are quite as rich and elaborate as the exteriors of the contemporary temples in the Mysore.

171. Colonnade of Hindoo pillars, east side. Delhi.
Interior view of the eastern Colonnade. Delhi.
Colonnade of Hindoo pillars, north side. Delhi. *By Bourne and Shepherd.*

172. Jaina temples at Dilwarrah. Mount Abu.
The Agni Coond at Achilgurh.
Ceiling from lower temple at Dilwarrah.
Ceiling from lower temple at Dilwarrah.
Pendant of dome in upper temple at Dilwarrah.
Ceiling of vestibule in upper temple at Dilwarrah.
View in quadrangle of temple at Dilwarrah.
View in temple at Dilwarrah.

173. Vestibule and shrine in temple at Dilwarrah.
Vestibule and shrine in temple at Dilwarrah.
Vestibule and shrine in temple at Dilwarrah.
Vestibule and shrine in temple at Dilwarrah.
Vestibule and shrine in temple at Dilwarrah.

174. View in Jaina temple at Dilwarrah.
Vestibule and shrine in temple at Dilwarrah.
Ceiling from lower temple at Dilwarrah.
Ceiling in upper temple at Dilwarrah.
Ceiling in the lower temple at Dilwarrah.
Ceiling in upper temple at Dilwarrah.

175. The so-called happy valley. Gwalior.
Ancient Jaina temple in the Fort. Gwalior.
Ancient Jaina temple in the Fort. Gwalior.
Ancient Jaina temple in the Fort. Gwalior. *By Bourne and Shepherd.*

There are few architectural scenes in India so remarkable as that of the temple city of Palitana in Gujerat. It is situated on two picturesque hills, and strongly fortified, though its only inhabitants are the sacred pigeons, and a few priests to take care of the shrines. None of those at present standing are very old, the more ancient belonging to the 11th century, but they are of all ages from that time to the present day. Of course, the oldest are the best, but some of those now erecting are remarkable for their elegance of form and detail.

176. General view of Motisah Tuk. Palitana.
General view of Motisah Tuk. Palitana.
General view. Showing Balabhai Temple. Palitana. *By Bombay Photo. Co.*

177. General view of the southern summit. Palitana.
Chunnuck and other temples. Palitana.
General view of the northern summit. Palitana. *By Bombay Photo. Co.*

178. Temple of Ardaseer Bugwan.
Temple of Ardaseer Bugwan.
Temple of Premabhoy Hembhoy. Palitana. *By Bombay Photo. Co.*

179. Principal shrine in the Bulawanee. Palitana.
The Chunnuck Temple. Palitana.
Details of the Temple of Chunnuck. Palitana.
Details of the Temple of Chunnuck. Palitana. *By Bombay Photo. Co.*

180. Interior of room and ceiling in the Bulawanee. Palitana.
Temples outside the Motisah. Palitana.
Tuk or enclosure of Premabhoy Hembhoy. Palitana.
Roadway leading to Ardaseer Bugwan. Palitana.
Temples. Palitana. *By Bombay Photo. Co.*

181. The Temple of Motisah. Palitana.
Gateway of the Temple Motisah. Palitana.
The Temple of Motisah. Palitana.
By Bombay Photo. Co.

Girnar is one of the oldest architectural sites in India, and now contains one copy of the edicts of Asoka, B.C. 250, carved on the rocks. The structural buildings, however, are contemporary with those of Palitana, which can be seen from it, and being more scattered and not so numerous, are not so picturesquely effective, though some of them are very beautiful in themselves. No buildings are now being erected there; Palitana having become the fashionable shrine.

182. General view. Girnar.
General view. Girnar.
General view. Girnar. *By Bombay Photo. Co.*

183. General view. Girnar.
Temples of Koomarpall and Parishnath. Girnar.
General view. Girnar, S.W.
By Bombay Photo. Co.

184. General view, showing Ambamatha on the top. Girnar.
Temple of Ambamatha. Girnar.
Old portion of Samprutti Rajah's Temple. Girnar. *By Bombay Photo. Co.*

185. Interior of Koomarpall's Temple. Girnar.
Interior of Temple Jypall. Girnar.
Koomarpall's and Samprutti Rajah's Temple. Girnar.
Koomarpall's Temple. Girnar.
By Bombay Photo. Co.

The four frames (186 to 189) illustrate two temples erected by rich merchants still living, and only completed, if they are complete, within the last few years. They have not the richness of detail of the older examples, and want the vigour and picturesqueness of their predecessors, but they are rich and beautiful examples of their class and do infinite credit to the liberality of their founders, and the taste displayed by their architects.

186. Temple of Huttee Singh. Front of entrance porch. Ahmedabad.
Temple of Huttee Singh. General view from the garden. Ahmedabad.
Swami Narayan Temple. The entrance gate. Ahmedabad. *By Captain Lyon.*

187. Temple of Huttesing Kesrising. Ahmedabad.
Interior of the Hindoo Temple. Ahmedabad.
Entrance to Shet Huttesing's Temple.
By Ritter and Co.

188. Temple of Huttee Singh. Detail of carving on S.E. side. Ahmedabad.
Temple of Huttee Singh. Front view.
Temple of Huttee Singh. Detail of carving on N.E. angle.
Temple of Huttee Singh. Side view of entrance porch. *By Captain Lyon.*

189. Swami Narayan Temple. Carved marble sea of the saint. Ahmedabad.
Swami Narayan Temple. Ahmedabad.
Temple of Huttee Singh. Angle view.
By Captain Lyon.

KASHMIR.

The architecture of Kashmir is so exceptional and so unlike anything in India, that like the styles of Nepal and Ceylon it hardly deserves a place in this collection. Though its entire omission might perhaps be felt as a blank.

The principal temple in the valley is that at Martund, said to be dedicated to the sun, and so far as its date can be ascertained the contemporary of Bobaneswar and Iwullee, these three, consequently, being the oldest structural temples,—excluding Buddhist Topes, of course,—now to be found in India.

The Takht-i-Soliman, though generally reputed as older, was probably erected in the middle of the 17th century.

Frame 192 contains examples of the wooden architecture still prevalent in the hills and valleys about Kashmir.

190. Ruins of Martund. Kashmir.
Ruins of Martund. Kashmir.
Ruins of Martund. Kashmir.
By Bourne and Shepherd.

191. Ancient temple at Nowshera. Kashmir.
Ancient temple at Nowshera. Kashmir.
Tukt-i-Soliman. Kashmir.
By Bourne and Shepherd.

192. Temple at Pangi.
The village of Kot Kulu. Kulu.
Temple at Chergaon. *By Bourne and Shepherd.*

MAHOMEDAN ARCHITECTURE.

The disposition of the frames, necessary to suit the form of the Exhibition building in this part of the Indian department, would have rendered a strictly chronological arrangement of the photographs nearly impossible, had such been deemed desirable. In regard to Mahomedan architecture, however, this is of comparatively little importance. The dates of all the buildings are known, and the succession of styles is more easily traced in each individual group than if the whole were sorted out into one consecutive series. In this class, therefore, it will be understood that the arrangement is generally more topographical than chronological, though the latter has been attended to as far as possible in each individual group.

Sher Shah, (1540–1545), was one of the most remarkable, though one of the last of the Patan or Afghan sovereigns of Northern India. His residence at Rohtas and his tomb at Sasseram in Behar, are both remarkable examples of his magnificence. The latter especially closes worthily a long series of Patan tombs which, though not so magnificent as those of their successors the Moguls, are generally more appropriate to their solemn purpose.

193. Gateway of Mahal Sarai palace. Rohtas.
The Barahdoware, or Twelve Gates. Rhotas.
The eastern face of Barahdoware. Rhotas.
By T. F. Peppe.

194. The tomb of the Emperor Sher Shah. Sasseram.
The tomb of Husain Khan Sur. Sasseram.
The tomb of the Emperor Sher Shah. Sasseram.
The tomb of Shamsher Khan. Shamshernagar.
By T. F. Peppe.

Frames 195 and 196 contain examples of Mahomedan tombs in the south of India, where the style, though wanting in that purity which distinguished it in the north, is not devoid of picturesqueness and grandeur. Tippoo Sultan's buildings sometimes betray the influence of European taste, which is always fatal in India.

195. The tomb of Mallik Rahman at Sira.
The Jumma Musjeed at Sira.
Old tomb. Sira.
Old tomb. Sira.
Tomb of Mahomed Khan. Sira.
By Col. H. Dixon.

196. The Jumma Musjeed built by Tippoo Sultan, in the fort. Seringapatam.
The Musjeed connected with Tippoo Sultan's tomb. Seringapatam.
The tomb of Hyder Ali Khan and Tippoo Sultan. Seringapatam.
Garden view of the tomb of Hyder Ali Khan and Tippoo Sultan. Seringapatam.
By Col. H. Dixon.

Gulburgah was the capital of the Bahmani dynasty of the Deccan from the year 1347 to 1525. Practically, however, it had been superseded by the Nizam Shahi dynasty of Beejapore before the year 1500, and all its principal mosques and tombs belong to the century and a half preceding that last date. The Jumma Musjid is one of the most remarkable of its class, and unique in its disposition, being lighted from the exterior instead of from a courtyard, as is universally the case in mosques of this importance in India.

197. Inscription on doorway of Goomut. Gulburgah.
Inscription on doorway of tomb. Gulburgah.
Tombs outside the walls of the Rosa Goomuts. Gulburgah.
Nugbut Kana gateway to the tank. Gulburgah.
By Bombay Photo. Co.

198. The Burra Roza. Gulburgah.
Chowdagarree Goomut. Gulburgah.
Inscription on doorway of the Goomut of Kubboolah Husgar Hussein. Gilburgah.
Interior of Bundah Nawaz Vullee Shah Mahomed Husgar Hussein. Gulburgah.
Inscription on doorway of the Goomut of Kubboolah Husgar Hussein. Gulburgah.
By Bombay Photo. Co.

199. Jumma Musjeed, within the fort. Gulburgah.
The ruins of the fort. Gulburgah.
Tomb of Bundah Nawaz Vullee Shah Mahomed Husgar Hussein. Gulburgah.
Interior of Jumma Musjeed. Gulburgah.
Goomut of Kubboolah Husgar Hussein. Gulburgah.
By Bombay Photo. Co.

200. Gateway of old fort. Gulburgah.
By Bombay Photo. Co.

Ruins at Indoor. *By Hooper and Western.*
Doorway and Burra Roza. Gulburgah.
Goomuts. Gulburgah.
Ruins of the fort. Gulburgah.
By Bombay Photo. Co.

Frames 201 to 203 contain illustrations of a series of tombs and mosques found in Scind and the Delta of the Indus. They are not remarkable for their magnificence, but are interesting as showing the connexion of the coloured tile decoration of Persia with the architecture of India.

201. Tomb of Mirza Jani Beg-Turkhan. Tatta.
Tomb. Built by Ameer Kholil Khan. Tatta.
The "Edgah." Tomb of Mirza. Tatta.
By Michie and Co., Kurrachee.

202. Tomb of Nawab Ameer Khan. Tatta.
Tomb and Edgah of Dewan Soorf Khan. Tatta.
Tomb. Built by Ameer Kholil Khan. Tatta.
By Michie and Co., Kurrachee.

203. Tomb of Mirza Jani Beg-Turkhan. Tatta.
Tomb of Goolam Shah Kullora. Hydrabad.
Tomb and Edgah of Dewan Soorf Khan. Tatta.
By Michie and Co., Kurrachee.

Juanpore was the capital of one of the most splendid of the minor dynasties of the East. Though they existed only from 1394 to 1476, during these 82 years they embellished their capital with a series of mosques, tombs, and public works, such as very few Indian cities can boast of. They have, too, all of them, a peculiar character that almost elevates their architecture into a separate style. Its principal characteristics are the sloping pyramidal form of their propylons, the absence of minarets, and the columnar arrangement of the courtyards of their mosques. These are so peculiar, that some have fancied these forms were derived from Buddhist architecture, but there seems no foundation for such an hypothesis.

204. Fort gate. Juanpoor.
Tomb. Punja shareef. Juanpoor.
Juanpoor.
Tomb. Punja shareef. Juanpoor.
Mahomedan tomb. Juanpoor.

205. Attallah mosque. Juanpoor.
Cloisters, Attallah. Juanpoor.
Dome of Attallah. Juanpoor.
Attallah. Juanpoor.
Screen, Attallah. Juanpoor.

206. The Shahzadahs. Juanpoor.
Memorial tomb. Juanpoor.
Budhist pillars. Juanpoor.
Tomb. On the Lucknow road.
No. 10 screen. Jumma Musjid. Juanpoor.
Lall durwazah. Juanpoor.

207. The tomb. Juanpoor.
Buddhist shrine. Juanpoor.
Tomb of Shere Gaman. Juanpoor.
The mosque. Juanpoor.

When the Mahomedans, on their conquest of India, selected Delhi as their capital (1206), they determined to adorn it with a mosque which should be worthy of their greatness. First, as an inscription records, they destroyed 27 temples of the infidels, and used the pillars so acquired to erect the courtyard of the mosque. They then employed their new subjects to erect the great screen of arches (209), and to adorn them with that exquisite style of workmanship and carving which their conquerors could appreciate, but could not execute; and lastly, they erected the Kutub Minar, the finest tower in India, 238 feet in height. Perhaps, too, they brought to this place the iron pillar of Dhava, 28 feet in length, and 5 feet 6 inches in circumference, till lately, if not now, the largest forging in the world, though executed 1,400 years ago.

208. The Kutub Minar. Delhi. Height, 238 ft. 47 ft. diameter of base. *By Sergt. G. T. Sparke.*
The Kutub Minar and surrounding ruins. Delhi. *By Bourne and Shepherd.*
The great arch and iron pillar. Delhi. *By Sergt. G. T. Sparke.*

209. Ruins of the two southern arches. Delhi.
General view of the arches. Delhi.
The great arch and iron pillar. Delhi. *By Bourne and Shepherd.*

Frames 210 to 215 illustrate, somewhat imperfectly it must be confessed, the architecture of the various cities now comprehended under the general name of Delhi, from the times of Altumsh (died 1236) to that of Suftar Jung of Lucknow (died 1756). The most striking of these is the Jumma Musjid, erected by Shah Jehan (1628–1658). But the tombs of Toghluk Shah (died 1325), with that of Humaioon (died 1556), and Suftar Jung, are all remarkable specimens of their class.

210. Ala-ood-deen's gateway. Delhi.
Tomb of Shums-ood-deen Altumsh. Delhi.
Ala-ood-deen's gateway, north entrance. Delhi. *By Bourne and Shepherd.*

211. The Jumma Musjid, from the north. Delhi.
The Jumma Musjid, the mosque and quadrangle. Delhi.
The Jumma Musjid, from the north-east. Delhi. *By Bourne and Shepherd.*

212. Mausoleum of Suftar Jung. Delhi.
Mausoleum of the Emperor Humaioon. Delhi.
The kila kona mosque. Delhi. *By Bourne and Shepherd.*

213. The palace, the Motee Musjid. Delhi.
Tomb of Nizam-ood-deen. Delhi.
Tomb of Mirza Jehangir. Delhi. *By Bourne and Shepherd.*

214. The palace, Lahore gate. Delhi.
Interior of the Chousat Kumba. Delhi.
View of the city, from the Jumma Musjid. Delhi. *By Bourne and Shepherd.*

215. Tomb of the Emperor Toghluk. Delhi.
Lahore from Wuzeer Khan's Mosque.
Gate of mosque from Minaret. *By Bourne and Shepherd.*

Lahore owes its architectural magnificence to Jehanghir (1605–1628), whose tomb it contains. At Aurungabad, Aurungzebe tried in vain to emulate the beauties of the Taje-Mehal at Agra, in honour of his favourite daughter Rabia Durani. Decay had then set in, and the copy a little better than a caricature. While the tomb of Mahomed Gaus at Gwalior, about 1570, shows the style of Akbar's reign in all its vigour and perfection.

216. View from palace in fort. Lahore.
Huzoor-i-bagh and fort. Lahore.
Jehangir's tomb, in the Shadra gardens. Lahore. *By Bourne and Shepherd.*

217. The tomb of Rabia Durani. Aurungabad.
The tomb of Rabia Durani from N.E. Aurungabad.
View from the Panchchuky. Aurungabad. *By Bourne and Shepherd.*

218. Jumma Musjid, with the fort at the back. Gwalior.
Mahomed Gaus's tomb. Gwalior.
Palace and pool of the fort. Gwalior. *By Major Herne.*

The palace called Deria Dowlut was erected by the celebrated Tippoo Sahib, between the years 1792–1799, and is a very pleasing specimen of the last form of Mahomedan architecture in India before it became debased by an admixture of Italian art.

The tombs at Joonaghur in Guzerat, erected within the limits of the present century, are also interesting, as exhibiting the last phase of the same art as applied to tomb architecture. There is in them a tendency towards fantastic forms, but great beauty in some of the details.

219. The Deria Dowlut in Seringapatam. Mysore. View of north and west sides.
The Deria Dowlut in Seringapatam. Part of corridor and garden.
The Deria Dowlut in Seringapatam. Part of corridor and garden. *By Captain Lyon.*

220. The Deria Dowlut. Seringapatam. The verandah.
The Deria Dowlut. Seringapatam. The drawing-room.
The Deria Dowlut. Seringapatam. Frescos on wall. *By Captain Lyon.*

221. Tomb of Mhajee Sahib. Joonaghur, Girnar.
Detail of the tomb of the late Nawab of Joonaghur, Girnar.
Details of the tomb of Mhajee Sahib. Joonaghur, Girnar. *By Captain Lyon.*

The Adil Shahi dynasty of Beejapore had a brief but glorious career of 170 years, between 1490 and 1660, during which period they were the bulwark of the faith against the Vijia-nugger dynasty of Hindus. During that period they adorned their capital with a series of buildings in a style like those of Juanpore, quite peculiar to themselves. The palaces in the citadel as well as the exquisite, Mehturee Mehal, are picturesque in outline, and particularly the last

named, beautiful in detail. The Jumma Musjid is one of the finest of its class in India, but the architectural pride of Beejapore are its Tombs of its last three kings. That of Ali Adil Shah (227) left unfinished in 1579; while the Ibrahim Royah,—1579 to 1626,—is more extensively and more elaborately ornamented than any other tomb in India; and the tomb of Muhammad is remarkable as being practically the largest and boldest specimen of dome construction in the world.

222. The citadel. Ruins at back of the harem. Beejapore.
The citadel. The Makkah Musjid. Beejapore.
The citadel. The Ananda Mahal or harem. Beejapore.
The citadel. The Audience Hall. Beejapore.
By Captain Lyon.

223. The Jumma Musjid. View of the front. Beejapore.
The Jumma Musjid. The interior.
Ibrahim Rozah. Window and carvings on wall.
Jumma Musjid. The Mehrab or altar.
By Captain Lyon.

224. Palace of the Asir-i-sharif. Beejapore.
Ruins of a portion of the citadel and old bridge. Beejapore.
The citadel, the sat-khund and garden. Beejapore.
Jumma Musjid, view from the roof. Beejapore.
By Captain Lyon.

225. Part of the ruins of citadel. Beejapore.
The moat walls of the citadel. Beejapore.
The great gun. Beejapore. *By Captain Lyon.*
The long gun. Gulburgah.
Inscription at the entrance to the bastion. Gulburgah. *By Bombay Photo. Co.*

226. Mehter Mahal, carvings on doors and windows. Beejapore.
The Mehter Mahal. North and west sides.
Tomb outside the city. Beejapore.
By Captain Lyon.

227. Ibrahim Rozah. The mosque. Beejapore.
Tomb of Muhammad Shah. Beejapore.
Tomb of Ali Adil Shah. Beejapore.
By Captain Lyon.

228. Ibrahim Rozah. The mausoleum.
Ibrahim Rozah. The colonnade.
Ibrahim Rozah. General view.
By Captain Lyon.

Ahmedabad was the capital of a Mahomedan dynasty for 187 years (1396 to 1483), and like Juanpore and Beejapore, had a style of architecture of its own. In this instance even more resembling that of the Hindus than the style of Juanpore. It was situated in Guzerat—a country long before, as well as now, remarkable for the architectural taste of its inhabitants;—and the Ahmed Shahi dynasty, though Mahomedan in religion, were Hindoos in blood and intermarried freely with the natives of the country. Hence the peculiarly rich and elaborate style of their architecture.

The public buildings of Ahmedabad are smaller in scale than those of the other Mahomedan capitals of India, but they make up for this by their number and variety and the exquisite beauty of their details. As a rule they are so similar in detail that it is at first sight difficult to detect their sequence, but there is a uniformity of excellence throughout that is very remarkable. The typical specimens of detail are, perhaps, the two pierced windows of the Bhudder (238), which in their class are unsurpassed; though few mosques are devoid of smaller bits of equal beauty.

229. Towers on the river Saburmuttee. Ahmedabad.
By Ritter and Co.
Kankariyah tank, carvings on outlet. Ahmedabad.
View of tomb from top of the mosque. Ahmedabad.
By Captain Lyon.

230. Jumma Musjid. General view. Ahmedabad.
The Teen Darwaza. Ahmedabad.
The Jumma Mosque, centre arch. Ahmedabad.
The gaol. Ahmedabad. *By Captain Lyon.*

231. Jumma Musjid. The mehrab or altar. Ahmedabad.
Jumma Musjid. The front. Ahmedabad.
Jumma Musjid. The interior. Ahmedabad.
By Captain Lyon.

232. Hurut Chaoodeen's musji. Ahmedabad.
Asarwa. Dada Harir's mosque. Ahmedabad.
Asarwa. Dada Harir's tomb. Ahmedabad.
By Captain Lyon.

233. Shah Alum. The mosque. Ahmedabad.
Shah Alum. Entrance to tomb. Ahmedabad.
Shah Alum's mosque. Ahmedabad.
By Captain Lyon.

234. Shah Alum. Gate at north side of enclosure. Ahmedabad.
Shah Alum. General view. Ahmedabad.
Shah Alum. Tomb at entrance. Ahmedabad.
Shah Alum. Carved stone windows of tomb. Ahmedabad. *By Captain Lyon.*

235. Ranee Seepree. General view. Ahmedabad.
Ranee Seepree. The mosque. Ahmedabad.
Ranee Seepree. Detail of carving. Ahmedabad.
By Captain Lyon.

236. Ranee Seepree. Detail of carvings on tomb. Ahmedabad.
Ranee Seepree. View from the road. Ahmedabad.
Mulik Alum's Mosque. Ahmedabad.
By Captain Lyon.

237. Mohafiz Khan Mosque. Ahmedabad.
Mohafiz Khan Mosque, carvings on minaret. Ahmedabad.
Mohafiz Khan Mosque, carved stone pulpit. Ahmedabad. *By Captain Lyon.*

238. Seedee's Mosque, marble window. Ahmedabad.
Carved window of stone in the Bhudder. Ahmedabad.
Carved window of stone in the Bhudder. Ahmedabad. *By Captain Lyon.*

239. Sirkej, ruins of palace on side of tank. Ahmedabad.
Sirkej, the Mosque. Ahmedabad.
Sirkej, the Tomb. Ahmedabad.
By Captain Lyon.

240. Roop Ranee. General view. Ahmedabad.
Roop Ranee. Portion of mosque in detail. Ahmedabad.
Roop Ranee. Carving on base of minaret. Ahmedabad. *By Captain Lyon.*

241. Sultan Kutbu'd-din Mosque. Ahmedabad.
Sultan Kutbu'd-din Mosque. Ahmedabad.
Shapoor Mosque. Ahmedabad.
Shapoor Mosque. Ahmedabad. *By Captain Lyon.*

242. Meakhan Chishlee's mosque. Ahmedabad.
Asarwa. Dada Harir's well. Ahmedabad.
Mahomedan Mushed. Ahmedabad.
Ashoorhoopee. Ahmedabad. *By Captain Lyon.*

243. Ranee Hazeera. Tombs of black and white marble. Ahmedabad.
Ranee Hazeera. Door carved in stone. Ahmedabad.
Ranee Hazeera. Door carved in stone. Ahmedabad.
Ranee Hazeera. Door carved in stone. Ahmedabad.
Ranee Hazeera. Carved stone window. Ahmedabad. *By Captain Lyon.*

Agra owes its architectural magnificence to the circumstance of its having been a favourite residence of the three greatest of the Mogul Emperors. The palace in the fort was commenced by Akbar, continued by his son Jehanghir (1605 to 1628), and completed by Shah Jehan. To this last-named monarch it also owes the Motee Musjid, the purest and most elegant of Indian mosques, though neither the largest nor the richest in decoration; and the same monarch erected the Taj Mehal, the most elegant of Indian tombs, though it too wants the richness of detail and boldness of conception which characterise other buildings of its class.

The tomb, too, of Etimad Dowlah (251), Akbar's celebrated minister, is richer in inlaid mosaic than any other tomb in India, though it is small, and its form hardly pleasing.

244. The fort. The Palace of Akbar. Agra.
The fort. Delhi gate. Agra.
The fort. Ummer Sing gate. Agra. *By Bourne and Shepherd.*

245. Front of the Motee Musjid. Agra.
Interior of the Motee Musjid, centre aisle. Agra.
Interior of the Motee Musjid. Agra. *By Bourne and Shepherd.*

246. The fort. Interior of the Zenana. Agra.
The fort. The palace of Akbar. Agra.
The fort. The palace of Akbar. Agra. *By Bourne and Shepherd.*

247. Carved stone pillars. Agra.
The fort. Interior of the Zenana. Agra.
The fort. Interior of the Zenana. Agra. *By Bourne and Shepherd.*

248. Taj and garden. From the entrance gate. Agra.
The Taj. From the garden. Agra.
The Taj. From corner of quadrangle. Agra. *By Bourne and Shepherd.*

249. The Taj. From the river. Agra.
The Taj. From the fountain. Agra.
The Taj. From the south. Agra. *By Bourne and Shepherd.*

250. Screen enclosing sarcophagi. Agra.
Gate of the Taj. Agra.
Quadrangle of the Motee Musjid. Agra. *By Bourne and Shepherd.*

251. Maucoleum of Prince Etimad-Dowlah. Agra. *By Bourne and Shepherd.*

Futtypore Sikri owes its importance solely to its being adopted by Akbar (1556–1605) as a residence. He built all the various pavilions of which the palace is composed, and also the great mosque and the marble tomb of Sheik Selim Chisti, a saint to whose prayers he was much indebted on an interesting occasion. As it was begun, so it ended with him. No sovereign seems ever to have resided there after the death of the founder, and it has consequently been allowed to fall into the state of ruin in which we now find it.

Akbar's tomb at Secundra (258), nearer Agra, is in the same style, and shows the same vigour and originality as all his other buildings.

252. General view of the ruins. Futtypore Sikri.
The Mosque of the quadrangle. Futtypore Sikri.
View of the ruins. Futtypore Sikri. *By Bourne and Shepherd.*

253. The Great Gate. From the S.E. Futtypore Sikri.
The Great Gate. From the village. Futtypore Sikri.
Interior of the Great Quadrangle. Futtypore Sikri. *By Bourne and Shepherd.*

254. The marble tomb of Sheik Selim Chisti. Futtypore Sikri.
Two of the trellised marble screens. Futtypore Sikri.
Interior of the Great Quadrangle. Futtypore Sikri. *By Bourne and Shepherd.*

255. The Palace of the Sultana of Constantinople. Futtypore Sikri.
Carved pillars in the Panch Mehal. Futtypore Sikri.
The Panch Mehal, five palaces. Futtypore Sikri. *By Bourne and Shepherd.*

256. The Palace of Beerbul. Futtypore Sikri.
Gooroo-ki-Mandi, temple of the Hindoo saint. Futtypore Sikri.
Akbar's office. Futtypore Sikri. *By Bourne and Shepherd.*

257. The Elephant Tower. Futtypore Sikri.
Pillar in the centre of Hall of Audience. Futtypore Sikri.
The Dewan-i-kass, or Hall of Audience. Futtypore Sikri. *By Bourne and Shepherd.*

258. The mausoleum of Akbar. Secundra.
The entrance gate, from the garden. Secundra. *By Bourne and Shepherd.*

The last six frames of the series are devoted to that mixture of Eastern outlines with Western details which make up that curious jumble of ideas which the Indians of the present day fancy is architecture. Yet all the buildings in Lucknow—it became a capital in 1775—are not equally bad. The great Emambara (263), the tomb of Zenab Aliya (260), and one or two others, are not without merit.

But the Kaiser Bagh, and the palaces exhibit an amount of vulgarity and bad taste unsurpassed by anything the world can show elsewhere, and curious when found executed by the same people who erected the buildings illustrated in the earlier parts of this series.

259. Scindiah's palace. Gwalior.
Chutter Munzil, &c. Lucknow.
Chutter Munzil, &c. Lucknow.
By Bourne and Shepherd.

260. The Chutter Munzil, from the river. Lucknow.
Tomb of Zeneb Aliya in the Hooseinabad. Lucknow.
Gate and garden of the Hooseinabad. Lucknow.
Buildings in the garden of the Hooseinabad. Lucknow. *By Bourne and Shepherd.*

261. Bird's eye view of the Kaiser Bagh. Lucknow.
Oude Exhibition. Lucknow.
Vinery and buildings in the Kaiser Bagh. Lucknow.
View in the Kaiser Bagh. Lucknow.
By Bourne and Shepherd.

262. East gate of the Kaiser Bagh. Lucknow.
The Kaiser Pasund. Lucknow.
The Kaiser Pasund. Lucknow.
By Bourne and Shepherd.

263. Gateway of the Hooseinabad bazaar. Lucknow.
Great Emambara and Mosque. Lucknow.
The Roumi Darwaza in the fort. Lucknow.
By Bourne and Shepherd.

264. La Martiniere, from the garden. Lucknow.
The Kaiser Bagh. Lucknow.
The fort, from the north-west. Deig.
By Bourne and Shepherd.

Note.

In this Catalogue of Photographs, no attempt has been made to adapt the spelling of the proper names to any one of the various systems for that purpose now prevalent in India. In each case the mode of spelling adopted by the Photographers has been adhered to, so as to assimilate this one with their Catalogues, and with the labels attached by them to their Photographs.

GROUP I.—MINING, QUARRYING, AND METALLURGY.

A.—COLLECTION CONTRIBUTED BY THE GEOLOGICAL SURVEY OF INDIA, UNDER THE DIRECTION OF DR. OLDHAM.

The collections illustrating the mineral wealth of the Indian empire have been, with very few exceptions, contributed by the Geological Survey of India, or through its intervention. To those specimens noted in the accompanying list which have been sent by others, the names of the senders have been attached. Where these specimens have been sent through the Geological Survey, the letters G. S. I. have been added.

In addition to the specimens here catalogued, a very fine series of the fossils, figured and described in the Palæontologia Indica, published by the Geological Survey of India, were sent to Vienna, but no sufficient room being available for their exhibition in the general building, they have been arranged at the Geological Institute, (K. K. Geologische ReichsAnstalt in the Razumoffsky-gasse, Landstrasse) where the Director of the Austrian Geological Survey has afforded the opportunity of making them conveniently accessible to geologists, and others interested in such studies.

Geological maps of various parts of India have also been sent, to show the style in which the geological structure of the country is represented, and the scale on which the Survey is carried out. The field maps of the Survey are represented by a MS. copy of the geological map of the Salt range in the Punjab, showing the detailed nature of the work in complicated and disturbed districts; while the maps on the same scale of 1 mile=1 inch of the entire district of Dumoh, with an index map on the smaller scale of 1 inch=4 miles, show the manner in which these are preserved and made available for local and other officers. Sheets of the finished maps, as finally published on the "Atlas of India" maps, are also given, including the country near Trichinopoly, and near Madras.

The collection also includes a complete series of the publications of the Geological Survey, embracing nine volumes, 8vo. of the Memoirs of the Geological Survey of India; five years issue of the Records of the Survey, and the complete series of the *Palæontologia Indica*, up to date, containing plates of fossils collected by the Geological Survey, with detailed descriptions.

All the numbers are on small paper labels, of an oval form, attached to the specimens.

Diamonds.

From Ramulkota taluq, Kurnool district, Madras Presidency. Forwarded to Geol. Surv. Ind. by T. Chase, Esq., Collr. of Kurnool.

Gold.

1. Auriferous sand, from Maunbhoom, Bengal. *See* Records, Geol. Surv. India, vol. ii. p. 11.
2. Native gold, from Maunbhoom, Bengal. *Ibid.*
3. Native gold, from Chaibassa, Bengal. *Ibid.*
4. Native gold, rolled, from Brahmini River, Bengal.
5. Auriferous sand, Singrowli, N.W. Provinces.
6. Washed gold, nuggets, Upper Assam. *See* Memoirs, vol. i. p. 90.
7. Gold (rolled), Dihong River, Upper Assam. Journ. Asiat. Soc. Bengal, vol. xxii. p. 511.
8. Gold (rolled), Noa-dehing River, Upper Assam.
9. Auriferous quartz, Malabar, Madras.
10. Auriferous felspar, Malabar, Madras.
11. Auriferous mica-schist, Malabar, Madras.
12. Auriferous clay, Malabar, Madras.
13. Auriferous sand, Shué Gyeen, Burmah. Mem. Geol. Surv. India, vol. i. p. 94.
14. Residue, after washing the sand, No. 13.
15. Native gold, from the sand.
16. Washed gold, from the same locality.
17. Native gold, near Amarapura, Burmah. See Mission to Court of Ava. p. 344.
18. Native gold, Little Tenasserim River, Tenasserim provinces.
19. Auriferous pyrites, Malacca.
20. Auriferous porphyry, Malacca.
21. Granite of Gold mines, Malacca.
22. Argillaceous sandstone, washed for gold, Malay Peninsula.

22*a*. Auriferous sand, from the Indus River, Kalabagh, Punjab.

Copper.

23. Sulphide of copper, with carbonate, Maunbhoom, Bengal. *See* Records, Geol. Surv. India, vol. iii. p. 74.

23*a*. Hollow castings of brass, representing elephant, peacock, owl, and fish. These castings are principally interesting from the mode in which they are produced by a single casting. The

design is fashioned on a core of dried clay, in wax. This is then covered by moist clay pressed into all the spaces; after drying in the air the whole is then heated, and the wax when melted is allowed to run out, leaving the pattern represented by the hollow space which it occupied. Into this the molten metal is poured, and when cast, the outer mould of clay is broken off and the inner core removed in same way.

From Maunbhoom, through Col. Rowlatt, Deputy Commissioner.

24. Manufactured copper, Dholbhoom. *See* Records, Geol. Surv. India, vol. iii. p. 94.
25. Purple copper, Deogurh, Beerbhoom.
26. Manufactured copper, from Singhbhoom, Bengal.
27. Native copper, found near Ranigunj, Bengal.
28. Native copper, with red oxide (cuprite), Burdhee, Singrowlie.
29. Manufactured copper (native reduction), Sikkim.
30. Nepaulite, with azurite in quartz, etc., Nepaul. Journ. Asiat. Soc. Bengal, xxiii. p. 170.
31. Copper pyrites (chalcopyrite), in talcose schist, Nepaul.
32. Purple copper (Bornite), with malachite, Nepaul.
33. Copper pyrites in talc schist. Pokri, Kumaon, Journ. Asiat. Soc. Beng., viii. 471; xii. 453; xiv. 471.
33*a*. Copper pyrites, from Puttiala mines, near Solon, Puttiala. Puttiala and Subathoo Mining Company, through Mr. Henwood, manager.
33*b*. Copper pyrites, with marcasite in slate, from Dareeba mines, Ulwar.
33*c*. Unbaked cakes of pounded copper ore, mixed with iron slag and cowdung.
33*d*. Similar cakes, after being baked, and ready for furnace.
33*e*. Copper "mus," or bloom ball, as taken from the smelting furnace.
33*f*. Copper cast in small bar ingots, after melting in refining furnace.
33*g*. Sulphate of copper.
33*h*. Sulphate of iron.
33*i*. Model of copper smelting and refining furnaces at work, to a scale of 2 feet=1 inch.
33*j,k,l*. Photographs of copper smelting furnace, of copper refining furnace, and of the entrance to the Dareeba copper mine. These specimens, model, and photographs, represent the manufacture of copper at the Ulwar mines, forwarded to G.S.I. by Captain T. Cadell, V.C., Political agent, Ulwar.
34. Sulphide, with carbonate of copper, Nellore mines, Madras Presidency.
35. Red oxide of copper (cuprite) with native copper and malachite, Nellore mines, Madras.
36. Carbonate of copper, in quartz, Nellore mines, Madras.
37. Reniform malachite, Nellore mines, Madras.
38. Copper pyrites, from Burmah.

LEAD.

39. Galena, from Deogurh, Beerbhoom.
40. Antimonial galena, in quartz, from Chota Nagpore.
41. Argentiferous galena, in talcose schist, from Nepaul.
42. Galena, in talcose schist, from Nepaul.
43. Argentiferous galena, from the Puttiala mines, Hurripoor.
44. Argentiferous galena, from the Subathoo mines near Subathoo, G.S.I. Contributed by the Puttiala and Subathoo Mining Company, through Mr. Henwood, manager.
45. Argentiferous galena, in quartz, from Ulwar, Rajpootana.
46. Lead (containing silver), reduced from the preceding ore, G.S.I., contributed by Captain Cadell, V.C., Ulwar.
47. Galena, from the Nulla Mullay hills, Kurnool district, Madras.
48. Galena, from the Bor Khamti hills, Assam.
49. Galena, from near Amarapura, Burmah.
50. Argentiferous galena, with barytes, from near Ava, Burmah.
51. Galena, from Burmah.
52. Galena, from Martaban.
53. Galena, with pyrites, from the Tenasserim River.

IRON.

54. Laterite, near the surface, from quarry near Cantonment Church, Belgaum, G.S.I. from the collect. of Belgaum, Bombay.
55. Laterite, 40 feet below surface, from Cantonment Church, Belgaum, G.S.I. from the collect. of Belgaum.
55*a*. Laterite, Wullubgurh, Belgaum district, G.S.I. from the collect. of Belgaum.
55*b*. and *c*. Laterite, Tull Waree Ghát, Belgaum district, from the collect. of Belgaum. *b*. superficial, and *c*. from roof of the Bara Kir cave.
55*d*. Laterite, Powitreegurh Chiekodi taluq, Belgaum district, Cr. of Belgaum.
56. Laterite, superficial, from Kulladghi.
57. 57*a*. and 58. Laterite, massive, from Kulladghi.
58*a*. and b. Laterite, massive, Mootgee hill, Bagehwaree taluq, Kulladghi.
59. Laterite, cemented by kunkur, from the Moolwad watershed ridge, Bagehwaree taluq, Kulladghi district.
60. Laterite, massive, cemented by kunkur, from the Moolwad watershed ridge, Bagehwarree taluq, Kulladghi district.
61. Laterite, from Munglepoor, Raneegunj district. The richer portions of the laterite are used in places as an ore of iron.
61*a*. 61*b*. 61c. Laterite, superficial from Sawyerpuram, Tinnivelly district, Dr. Caldwell.
63. Ironstone from Gopalgunj, Raneegunj coalfield; contains 47·35 per cent. of iron.
64. Ironstone, from Muddanpoor, Raneegunj coalfield; contains 29·31 per cent. of iron.
65. Ironstone, from 1 mile S.E. of Muddanpoor, Raneegunj coalfield; contains 40·99 per cent. of iron.
66. Ironstone, from 1 mile S.E. of Muddanpoor, Raneegunj coalfield; contains 41·36 per cent. of iron.
67. Ironstone, south of Amnolah, Raneegunj coalfield; contains 30·00 per cent. of iron.
68. Ironstone, south of Amnolah, Raneegunj coalfield; contains 52·00 per cent. of iron.
69. Ironstone, from Gobindpoor, Raneegunj coalfield; contains 43·24 per cent. of iron.

70. Ironstone, from Bunooloo, Raneegunj coalfield; contains 44·00 per cent. of iron.
71. Ironstone, from North of Pahargora, Raneegunj coalfield; contains 51·28 per cent. of iron.
72. Ironstone, from Raneegunj, Raneegunj coalfield; contains 46·66 per cent. of iron.
73. 73*a*. Ironstone, from Barool, Raneegunj coalfield.

The foregoing are all from the "Ironstone shales" of the Raneegunj Coalfield, and occur in great abundance. They are all clay ironstones.

74. Ironstone, coarse and earthy, from Mahomed Bazaar, in Beerbhoom. This is the ore which was used at the Mahomed Bazaar Ironworks, when they were in operation.
75. Pig iron, white, produced from the ore No. 74 at the Mahomed Bazaar works.
76. Pig iron, grey, produced from the ore No. 74 at the Mahomed Bazaar works.
77. Iron made by the ordinary native process, after first reduction, or what is called "cutcha" iron.
78. Iron, reheated and hammered, or refined, "pucka" iron.
79. Iron, as smelted and used by the Sonthals.
80. Ironstone from Karanpura, in Hazareebagh district.
81. Iron, produced from this ore, and No. 81*a*, the same iron after reheating and forging, G.S.I. From Colonel Boddam, Hazaribagh.
82. Magnetic iron ore from Titooree.
83. Magnetic ironsand from Kurhurbari, Hazaribagh district.
84. Iron, produced from this ore, No. 83 and 84*a*, the same iron refined, from Colonel Boddam, Hazaribagh.
85. Magnetic ironsand, from near Cherra Poonji, Khasia hill, East Bengal.
86. Iron produced from this ore, and No. 86*a*, the same iron refined by two successive reheatings and rehammerings.
87. Magnetic ironsand, from Upper Assam.
88. Iron (malleable), produced from this ore.
89. Iron (malleable), produced at Doobri, Assam.
90. Iron (malleable), from Jeypoor, Assam.
91. Iron (malleable), from Dingeroo, Assam.
92. Iron (malleable), from Golaghat, Assam.
93. Iron, from the magnetic ironsand, Upper Assam.
94. Iron, from Talcheer, Orissa. This specimen shows the quantity produced by the native smelters at one operation.
95. Iron, from Kunkerai, Cuttack. This specimen shows the quantity produced by the native smelters at one operation.
96. Brown hæmatite iron ore, from Sumbulpur; contains 42·5 per cent. of iron.
97. Iron, produced from this ore, after first reduction, and
98. Iron, the same reheated, and rehammered, and
98*a*. Iron, after the third reheating.
99. Micaceous iron ore, from Mogala, Jubbulpoor district.
100. Micaceous iron ore, from Sehora Road, Jubbulpoor district. This ore is not used by the native smelters of iron.
101. Red hæmatite, from Jowlee, Jubbulpoor district.
102. Pisolitic brown hæmatite, from Bijooree, Jubbulpoor district.
103. Iron (malleable), produced from the micaceous ore of Mogala.
104. Iron (malleable), from the red hæmatite of Jowlee.
105. Iron (malleable), from the brown hæmatite of Bijooree.
106. Mineral paint, of fine red colour, produced from the red hæmatite of Jowlee.
106*a*. Specimens of this paint used alone, and mixed with other colours. This mineral colour is now largely used. It is sold, at the Kutnee station of the East Indian railway, near the works, at 7 rupees (about 7 florins) per cwt. The works have been established by, and are carried on under the direction of W. G. Olpherts, Esq., C.S., who has furnished the specimens. G.S.I.
107. Magnetic iron ore, from the Nerbudda valley.
108. Red hæmatite from the mines at Jauli or Jowlee in the Nerbudda valley.
109. Earthy red hæmatite, from Tendukkera, in the Nerbudda valley.
110. Iron, malleable, but inferior in quality from an admixture of sulphur, from Nerbudda valley.
110*a*. Earthy brown hæmatite, from the Nerbudda valley.
110*b*. Iron produced from this ore, and
110*c*. Iron, the same after reheating and refining, from Nerbudda valley.
112. Hæmatite, from Heerapoor, Bundlekund, contains 64·00 per cent. of iron.
112*a*. A portion of a dish or pan for baking chupatties, (unleavened thin cakes), manufactured from the iron produced from the Heerapoor ore.
113. Magnetic iron sand, from Nepal, contains 58·33 per cent. of iron.
114. Magnetic iron sand, from Sheil, near Simla, contains 67·00 per cent. of iron.
115. Micaceous iron ore, from the N.W. Himalayas.
116. Hæmatite, earthy, from Kumaon.
117. Hæmatite, earthy, from Kumaon.
118. Pisolitic ironstone, from Kumaon.
118*a*. Pisolitic ironstone, from Kumaon.
119. Pig iron, produced at the Dehchouree Iron Works, Kumaon (in high furnaces).
120. Limonite with magnetite. This is the ore used in the iron works at Ulwar, Rajpootana.
121. Iron, produced from this ore.
121*a*. Model of iron smelting and reducing furnaces, prepared carefully to the scale of 2 feet=1 inch. G.S.I. Made under the direction of Capt. T. Cadell, V.C., Political Agent, Ulwar.
122. Photographs, showing (*a*) the withdrawal of the bloom-ball from the iron smelting furnaces, and (*b*) the mode of cutting the bloom ball into two pieces, and (*c*) photograph of iron smelting furnace.
124. Hæmatite, very pure ore, from Mendki, in the Chanda district, Central Provinces. Sent by Central Provinces Committee.
124*a*. Iron, from Mendki.
124*b*. Iron, from Mendki, refined.
125. Hæmatite, from Mendki, Central Provinces. Sent by Central Provinces Committee.
126. Magnetic iron, from the Kunjamallay hill, near Salem, Madras.
127. The same ore in broken lumps as picked up on surface.
127*a*. The same ore, in smaller and more rounded pebbles. Sent by Madras Committee.

128. Magnetic iron sand from the South of India.
129. Wootz, or native steel-iron, produced from this sand.
130. Iron, of native manufacture, with charcoal, from near Salem. Sent by the Mysore Committee.
131. Wootz, of native manufacture, with charcoal, from near Salem. Sent by the Mysore Committee. Of excellent quality.
132. Crucible used in the manufacture of this steel-iron. Sent by Madras Committee.
133. Pig iron, from the Salem Ironworks (not now in operation).
134. Pig iron (white), from the East India Ironworks at Porto Novo.
135. Pig iron (grey), from the East India Ironworks at Porto Novo.
136. Pig iron, with graphite crystallized in hollows.
137. Specular iron ore, from Burmah.
138. Brown hæmatite, with magnetic iron, from Tavoy, Tenasserim.
139. Brown hæmatite, from Mergui, Tenasserim.
140. Steel wire, of various thicknesses. This is used for the different strings or wires of the native sittara or guitar. Sent by the Mysore Committee.

Chromium.

141. Chromite, from Hanle, Ladak.
142. Chromite, from Salem. Sent by Madras Committee.
143. Chromite, from near Salem (the so-called "Chalk Hills").
144. Bichromate of potash, from Salem ore.

Manganese.

145. Psilomelane, with limonite, from Tavoy, Tenasserim.
146. Psilomelane, from Mergui, Tenasserim.

Tin.

147. Impure tinstone, from north of Parisnath Hill, in the district of Hazaribagh. Contains 32·4 per cent. of tin. This lode was worked for a few months, but unsuccessfully.
148. Tin produced from No. 147, from north of Parisnath Hill, in the district of Hazaribagh.
149. Tinstone (stream tin), from Kaymakhpeu, 90 miles from Tonghoo, British Burmah.
150. Tinstone, in crystals, from the Karen Hills, east of Tonghoo.
151. Tinstone, in crystals, crushed, ready for the furnace.
152. Tin, produced from No. 151, cast in the hollow of a split bamboo.
153. Tinstone, from Henzai Bay, Moulmein.
154. Tinstone, artificially washed from the decomposed granite of a vein, No. 154*a*, in the Kahan Hill, near Mergui.

154*a*. Felspathic vein, holding crystals of tinstone.

155. Tinstone, artificially washed from the decomposed granite of a vein, No. 154*a*, in the Kahan Hill, near Mergui.
156. Tinstone, in crystals, from the Kahan hill, near Mergui.
157. Tinstone, with wolfram, from Gahmon Mine, Mergui. This and the following show each the result of separate washings of the stream tin from the various localities.
158. Tinstone, from Thabawliek River, Mergui.
159. Tinstone, from Khamoungtang River, Mergui.
160. Tinstone, from the Malewun River, a tributary of the Pakchan, Tenasserim Provinces. Each separate bottle shows the result of a separate washing of the stream tin deposit.
161. Tinstone, from the Bhenong River, a tributary of the Pakchan River.
162. Tinstone, from the Bokpyen River, a tributary of the Pakchan River.
163. Tinstone, from the Thengdau River, a tributary of the great Tenasserim River.
164. Tin, in small ingots, produced from stream tin, weight about 1 lb. 4⅕ oz.
165, 166. Tin, in rude castings. These are locally used as money, or exchanged for goods, at the rate of four annas, or sixpence, each.
167. Tin, in ingots, from Tenasserim.
168. Tin castings, from Tavoy.
169. Tin castings, from Tavoy.
170. Tinstone, from Srimenauti, Malay Peninsula.
171. Tinstone, from Salengore, Malay Peninsula.

Antimony.

172. Stibnite, sulphide of antimony, from near Shigri glacier, Lahoul.
173. Stibnite, from Moliye, Ava.
174. Stibnite, from Moulmein.
175. Antimony, pure, said to have been found on shore in Straits Settlements.

Coal.

The coal trade in India is daily becoming of greater importance. The amount raised had increased between the years 1858 and 1868 from 220,082 tons to 484,642 tons, or considerably more than doubled. The mines are gradually being extended, and worked in a better manner than formerly, and the coal is sent to market in a better state. The series of specimens exhibited contains examples of almost every variety of coal now in use.

173. Coal, from the Ranigunj seam, Ranigunj. Depth of shaft (from surface to coal), 200 feet; thickness of seam, 14 feet.

Specific gravity	1·318	1·360	1·355
Loss on heating at 212°	6·200	6·700	6·200
Loss at red heat (including moisture)	35·400	34·0	34·6
Carbon	66·46	67·77	66·81
Hydrogen	4·89	4·79	4·86
Oxygen and nitrogen	11·35	13·58	14·27
Sulphur	1·30	0·86	0·96
Ash	16·00	13·00	13·10

Coal dried at 212°.

N.B.—These and the following analyses made in the laboratory of the Geological Survey of India are not of the individual specimen exhibited, but of other average specimens from the same seams.

174. Coal, from Nimcha Colliery, Ranigunj Coalfield. Depth of Shaft, 77 feet; thickness of seam, 17 feet 6 inches.

Spec. gravity	1·422
Loss on heating at 212°	5·40
Loss at red heat (including moisture)	31·00
Carbon	63·94
Hydrogen	4·60
Oxygen and nitrogen	11·36
Sulphur	1·00
Ash	18·90
	100·00

Coal dried at 212°.

175. Coal, from Mudhoopoor Colliery, Ranigunj Coalfield. Depth of shaft, 109 feet; thickness of seam, 13 feet.

Spec. gravity	1·366
Loss on heating at 212°	6·60
Loss at red heat (including moisture)	34·20
Carbon	68·36
Hydrogen	4·99
Oxygen and nitrogen	11·33
Sulphur	0·82
Ash	14·00
	100·00

Coal dried at 212°.

176. Coal, Cheenakoory Colliery, Ranigunj Coalfield. Depth of shaft, 232 feet; thickness of seam, 6½ feet.

Spec. gravity	1·270
Loss on heating at 212°	4·50
Loss at red heat (including moisture)	32·60
Carbon	66·12
Hydrogen	4·68
Oxygen and nitrogen	13·97
Sulphur	1·23
Ash	14·00
	100·00

Coal dried at 212°.

177. Coal from Sanktoria Colliery, Ranigunj Coalfield. Depth of shaft, 152 feet; thickness of seam, 11½ feet.

Spec. grav.	1·343
Loss on heating at 212°	2·200
Loss at red heat (including moisture)	25·40
Carbon	68·89
Hydrogen	4·52
Oxygen and nitrogen	12·27
Sulphur	·82
Ash	13·550
	100·00

Coal dried at 212°.

This coal yields 74·6 per cent. of coke.

178. Coke from the Sanktoria coal.

179. Coal from Beldanga Colliery, Ranigunj Coalfield. Depth of shaft, 58 feet; thickness of seam, 10 feet.

Spec. grav.	1·458
Loss on heating at 212°	5·200
Loss at red heat (including moisture)	33·400
Carbon	64·28
Hydrogen	4·48
Oxygen and nitrogen	11·18
Sulphur	·86
Ash	19·20
	100·00

Coal dried at 212°.

180. Coal penetrated and altered by the intrusion of (trap) volcanic rocks.

181. Coal having a columnar structure and partially coked, induced by the contiguity of a large dyke.

182. Coal from Dumarkoonda Colliery, Ranigunj Coalfield.

Spec. grav.	1·368
Loss on heating at 212°	2·00
Loss at red heat (including moisture)	23·20
Carbon	71·86
Hydrogen	4·67
Oxygen and nitrogen	8·78
Sulphur	·69
Ash	14·00
	100·00

Coal dried at 212°.

183. Coal from Baboosole Colliery, Ranigunj Coalfield. Depth of shaft, 144 feet; thickness of seam, 13 feet.

Spec. grav.	1·378
Loss on heating at 212°	6·80
Loss at red heat (including moisture)	34·20
Carbon	68·20
Hydrogen	5·04
Oxygen and nitrogen	10·66
Sulphur	1·10
Ash	15·00
	100·00

Coal dried at 212°.

The coals noted above are all from the pits of the *Bengal Coal Company*, by whom they have been contributed to the Geological Survey.

184. Coal from Mungulpoor Pit, Ranigunj Coalfield.

Spec. grav.	1·370
Loss on heating at 212°	5·80
Loss at red heat (including moisture)	32·20

Carbon	68·91
Hydrogen	4·80
Oxygen and nitrogen	12·11
Sulphur	·88
Ash	13·30
	100·00

Coal dried at 212°.

185. Coal from Neejiah Pit, Ranigunj Coalfield.

Spec. grav.	1·394
Loss on heating at 212°	5·00
Loss at red heat (including moisture)	34·20
Carbon	63·77
Hydrogen	4·62
Oxygen and nitrogen	12·61
Sulphur	·50
Ash	18·50
	100·00

Coal dried at 212°.

186. Coal from Pooranadeep Pit, Ranigunj Coalfield.

Spec. grav.	1·501
Loss on heating at 212°	6·50
Loss at red heat (including moisture)	30·80
Carbon	57·09
Hydrogen	4·47
Oxygen and nitrogen	12·51
Sulphur	1·63
Ash	25·30
	100·00

Coal dried at 212°.

These three coals are from the works of the Ranigunj Coal Association, by whom they have been contributed to the Geological Survey.

187. Coal from the Dhussul Seam, Ranigunj Coalfield. The section is—

	Ft.	In.
Roof of coal, Sandstone.		
Coal	7	0
Parting and Coal	2	0
Parting	0	1
Coal	1	1
Parting	0	3
Coal	2	3
Parting	0	1
Coal	1	6
Parting	0	1
Coal	4	6
Parting	0	6
Inferior coal	8	0
Parting and coal	5	0
	32	4

Sandstone (floor).

188. Coal from the Chowkeedargah Colliery, Ranigunj Coalfields. The section of this seam is—

	Ft.	In.
Roof Sandstone and shale.		
Slaty coal, left in working as roof	3	0
Shale parting	0	9
Coal	3	6
Pyritous parting	0	1
Coal	2	6
Inferior coal	6	0
	15	10

White Sandstone (floor).

189. Coal from the new Dhussul Seam, Ranigunj Coalfield. The section is—

	Ft.	In.
Sandstone (roof).		
Slaty coal	1	6
Shale parting	0	3
Good coal	5	10
Shale parting	0	2
Coal	0	9
Shaly coal	3	0
	11	6

These three coals, Nos. 187, 188, 189, have been contributed by the "Equitable Coal Company," through their manager, T. Sopwith Hindhaugh, Esq.

190. Coal from Searsole Colliery
191. Coal from Jumaree Colliery

} Representatives of Baboo Gobind Pundit.

192. Coal, with curved joints, called Ball-coal. *See* Journ. Asiat. Soc. Bengal, xvii. 59, 703; xviii. 412; xix. 75; from Seetarampoor, Ranigunj Coalfield.

193. Coal from Seetarampoor Seam, Ranigunj Coalfield.

194. Coal from Ramjeebunpur Colliery, Ranigunj Coalfield.

195. Artificial fuel, from Seetarampoor coal.

195*a*. Artificial fuel, from Bengal Coal Company's coal, Ranigunj. There is a large amount of waste and dust or small coal, produced in working the laminated and friable coal of the Ranigunj field. It is of high importance to utilize this. The specimens now exhibited have been prepared by Mr. Grant, the manager of Messrs. Apcar & Co's. Collieries, and are good useful fuel in a compact and portable form.

196. Coal from Kurhurbari Colliery, Hazaribagh district. Depth of shaft, 73 feet; thickness of seam, 10 feet. From Bengal Coal Company. G. S. I.

197. Coal from Ramghur, Hazaribagh, G. S. I. From Col. Boddam, Deputy Commissioner, Hazaribagh.

198. Coal from Palamow, G. S. I. From Deputy Commissioner, Lohardugga.

199. Coal. Top of No. 2 seam at the Gurrawarra or Mohpani Collieries. Thickness of seam, 22 feet, G. S. I. From Nerbudda Coal and Iron Company, through C. Maynard, Manager. Records, Geol. Surv. India, vol. iii. p. 1.

199*a*. Coal. Bottom of same seam, No. 2. Thickness, 22 feet, G. S. I. From Nerbudda Coal and Iron Company, through C. Maynard, Manager. Records, Geol. Surv. India, vol. iii. p. 1.

200. Coal, from No. 3 seam from the same collieries, G. S. I. From Nerbudda Coal and Iron Company, through C. Maynard, Manager. Records, Geol. Surv. India, vol. iii. p. 1.

201. Coal. Top of No. 4 seam, from same collieries. G. S. I. From Nerbudda Coal and Iron Company, through C. Maynard, Manager. Records, Geol. Surv. India, vol. iii. p. 1.

202. Coal. Bottom of No. 4 seam, G. S. I. From Nerbudda Coal and Iron Company, through C. Maynard, Manager. Records, Geol. Surv. India, vol. iii. p. 1.

203. Coal from Chanda. From Nagpore Committee. (3 pieces.)

The foregoing coals are all from the great Indian coal-bearing series of rocks which belongs to the same horizon (geologically) as the lowest Permian or uppermost coal measures of Europe (approximately).

The following coals are of different geological age :—

204. Coal, from near Cherra Poonji, Khasia Hills, East Bengal.

This occurs at the base of the Nummulitic series, G. S. I. From Colonel Bivar, Deputy Commissioner, Khasia Hills.

205. Coal, from Thangjinath, Khasia Hills. This bed is lower in the geological series, and probably belongs to the latest portion of the cretaceous series.

206. Coal, from Lakadong, Jynteah Hills. Tertiary.

TOOLS.

207. A set of the tools used by the native colliers is also exhibited. They consist of a crowbar, hammers, chisels, wedges, a vessel made of part of a bamboo, for holding oil and a crude lamp cut out of stone, in which this oil is burned. There is little or no fire-damp or explosive gases from the Indian coals, and the mines are all worked with open lights. Sent by T. Hindhaugh, Esq., Equitable Coal Company.

208. Another series of tools, such as are used in the native manufacture of iron is shown. They consist of an instrument used for breaking the ore, a pair of large tongs, and a pair of smaller tongs. An instrument for breaking the smelted iron—a pair of bellows such as are used with the smelting furnaces, an instrument used in digging the iron-ore, and a mamooty or common shovel. Sent by the Madras Committee.

SALT.

Of the salt produced and used in India, there are two great varieties. One, salt produced by evaporation of the water of brine-springs, salt-lakes, and of the sea, and so artificially crystallised. The other native rock salt, which is worked in several places, but most largely in the Salt Range, Punjab, and across the river Indus, in the Kohat district. There is also a large amount of salt imported from Great Britain, and used chiefly in the neighbourhood of the port towns.

The general section of the Salt Range is illustrated by a series of specimens of the successive beds in the immediate neighbourhood of the very extensive mines near Pind Dadun Khan, now called "The "Mayo Mines."

In descending order, these are :—

210. Limestone, nummulitic; average thickness, 250 feet. From Keora Hills, Baghanwalla.
211. Cherty limestone.
212. Coal, thin irregular seams.
213. Shaly coal.
214. Hæmatite.
215. Whitish friable sandstone.*
216. Green Sandstone.*
217. Conglomerate.*
218. Conglomerate.*
219. Pebbles of crystalline rocks, from Conglomerate.*
220. Flaggy beds, with pseudomorphic crystals from salt.†
221. Flaggy beds.†
222. Flaggy beds, with rippling or current marks.†
223. Grey magnesian sandstone.‡
224. Grey magnesian sandstone.‡
225. Grey magnesian sandstone with current markings.‡
226. Slab with annelid markings.§
227. Dark micaceous shales with *Obolus*.
227*a*. Dark micaceous shales with *Obolus*.
228. Slab with annelid tracks.
229. Dull red sandstone.‖
229*a*. Dull red sandstone.‖
230. Hard layer in purple marl.‖
231. Red and variegated gypsum.¶
231*a*. Red and variegated gypsum.¶
232. Porphyritic volcanic tuff.¶
233. Decomposed volcanic tuff.¶
234. Grey gypsum.¶
235. Bituminous shale, occurring in a 6-foot band.¶
236. Flaggy magnesian limestone.¶
237. Red gypseous marl.¶
238. Red gypseous marl.¶
239. Red gypseous marl.¶
240. Gypsum, bluish in colour, approaches anhydrite, and contains only 5·0 of water.¶
241. Purple gypseous marl.¶
242. Grey gypsum.¶
243. Red selenite.¶
244. Fetid bituminous magnesian limestone, with coaly pockets.¶
245. Fetid bituminous magnesian limestone; bands of from 5 to 20 feet, and lenticular masses.¶
246. White and grey gypsum.¶
247. Grey conglomeratic salt.**
248. Dull red earthy salt, or Kuller, forms roof.**
249. White salt, Retrans seam, 25 feet thick.**
250. Dull earthy red salt, or "Kuller," 10 feet thick.
251. Rose-coloured salt, Buggy seam, 100 feet thick.
252. Purple and variegated gypseous earthy salt, or "Kuller," 50 feet.

* ? Cretaceous. Average thickness 200 feet.
† ? Triassic. Average thickness 100 feet.
‡ ? Palæozoic. Average thickness 200 feet.
§ Silurian shales and flags.
‖ Purple sandstone series, age not more recent than Silurian; average thickness, about 500 feet.
¶ Gypseous and marly part of the salt series. Older than the purple sandstone. Average thickness 500 feet.
** Salt series of the Keora mines. Lowest known portion of the rock. Average thickness 600 feet.

253. Homogeneous pink salt, Soojewal seam, 50 feet.
254. Reddish grey earthy salt, or "Kuller," 100 feet thick.
255. Sulphate of potassa and magnesia, Kieserite, disseminated through a zone of 6 feet in thickness. At the base of this comes—
256. Finely laminated mixture of earthy common salt, and Epsom salts, 7 feet in thickness.
257. Pink and white salt, Phurwalla seam, 50 feet thick.
258. Impure salt, apparently from below the Phurwalla seam.
259. Red salt, from the old "Billuwalla" mine, apparently the lowest seam visible in the series.

The geological section or series below this is unknown.

The following specimens are of the salt and associated saline minerals, from the large mines at Keora, (the Mayo mines).

260. Block of rock salt, cut vertically from the Phurwalla, 50 feet seam of salt; the inclined coloured bands show the lines of stratification, dip of beds *in situ*, 35° to N. 30 W.

Owing to its size this specimen (and the following one) has necessarily been placed a little apart from the general collection. They will be found at the north-west end of the Indian department.

261. Pale red and whitish salt in natural cubes of large size, from the Soojewall seam.
262. Specimens of clear transparent cubic crystals of salt, from the surface of a fissure in the Soojewall seam.
263. Slab of salt, with cubes on surface, from the Soojewall seam.
264. Salt, crystallizing in pyramidal cubic forms, occurring with glauberite, and associated with the ordinary cubical crystals, from Phurwalla seam.
265. Block, composed of large cubic and hopper crystals of salt, formed by slow evaporation of a brine-pool, from the old mine Koosuk, 10 miles from Keora.
266. Cluster of crystals, similarly formed, from the old mine Koosuk, 10 miles from Keora.
267. Stalactitic salt, from the Mayo mines.
268. Fibrous salt, formed on the surface of saline earth within the mines, from the Mayo mines.
269. Dendritic salt, formed by drippings from stalactites, from the Mayo mines.
269*a*. Undetermined mixture of gypsum and common salt.
270. Impure Epsomite incrusting the saline marl of the roof of Phurwalla seam.
271. Glauberite, in oblique rhombic prisms, from a fissure in salt seam, associated with pyramidal and ordinary cubes of salt, from Phurwala seam.
272. Sulphate of potassa and magnesia, thickly disseminated through a 6-feet zone of No. contains—

Sulphate of potassa - -	38·00
Sulphate of magnesia, Kieserite -	58·02
Chloride of potassium, Sylvine -	3·80
Water - - - - -	·62
	100·44

273. Crystals of selenite, from a fissure in the salt seam; from Soojewalla salt seam.
274. Massive alabaster-like gypsum, of pink colour; from the Mayo mines.
275. Anhydrite, partially affected by gypsum, contains 5 per cent. of water; from the Mayo mines.
275*a*. Granular gypsum, with detached crystals of quartz, bipyramidal, imbedded. From Maree on the Indus river.
275*b*. Quartz crystals, from Maree on the Indus river, separated from the matrix.

The preceding series of salts has been contributed to the Geological Survey by the Commissioner of Inland Customs, through H. Warth, Ph.D.

Artificially Evaporated Salts.

276. Bunwar salt, from Warapada, Ganjam.
277. Ganjam salt, from Ganjam, Madras.
278. Punga salt, from Pooree, Bengal.
279. Kurkutch salt, from Kuttack, Bengal.

The preceding salts are all derived from the waters of the sea along the coast.

280. Sultanpoori salt, from Basseerpoor, Goorgaon.
281. Black salt, from Bheerwarree, Hissar.
282. Chotia salt, from Gwalior.
283. Kuteela salt, from Bhurtpoor.
284. Punniah salt, from Budungurh Bhurtpoor.
285. Sambhur salt, red variety, from the Sambhur Salt lake, or jheel, in Jeypoor.
286. Sambhar salt (white variety), from the Sambhur Salt lake, or jheel, in Jeypoor.

The red variety is only obtained during the hottest time of the year. The colouring matter is organic.

287. Deedhwarrah salt, from Deedhwarrah, Jodhpoor.
289. Phollowdee salt, from Phollowdee lake, Jodhpoor.
290. Kansia salt, from Puchbhudra lake, Jodhpoor.
291. Kharee salt, from Bikaneer.

The preceding salts are all derived from the water of salt springs, or of brine lakes.

292. Buragara salt, from Patree, Ahmedabad, Bombay.
293. Buragara salt, from Geegeewarra, Bombay.
294. Black Kokan salt, from the Matoonga Rawlee pans, Dadur, Bombay.
295. Rock salt, from the rivers at Mundi.

The following salts (No. 296 to No. 305) are entirely from the water of the sea; evaporated in shallow basins artificially made, by the heat of the sun. They are from the Madras coast, and have been sent by the Madras Committee.

296. Salt (1st sort), from the Padarti Cotaur, in the Nellore district. C. E. Plunkett, Esq., Deputy Collector.
297. Salt (2nd sort), form the Padarti Cotaur, in the Nellore district. C. E. Plunkett, Esq., Deputy Collector.
298. Salt (3rd sort), from the Padarti Cotaur, in the Nellore district. C. E. Plunkett, Esq., Deputy Collector.
299. Salt (3rd sort), from Kannparti Cotaur.

300. Salt (4th sort), from Kannparti Cotaur.
301. Salt (5th sort), from Pakarda Cotaur.
302. Salt (5th sort), from Pakarda Cotaur.
303. Salt, from South Arcot district, Chunampelt.
304. Salt, from South Arcot district, Merkanum.
305. Salt, from South Arcot district, Gundalum.
306. Earth salt from the Kurnool district.
307. Earth from which this earth salt is produced.
308. Saltpetre, unrefined.*
309. Saltpetre, refined.*
310. Alum shales, from Kalabagh, on the Indus river.
311. Alum shale, burnt and ready for the manufacture of the salt.
312. Alum prepared from these shales.

About 600 tons of alum are made annually at the Kalabagh works.

313. Alum, as commonly sold in the markets of the country.

Miscellaneous Economic Minerals.

314. Gypsum (selenite), from the Cretaceous rocks. Ootatoor, Trichinopoly district.
315. Gypsum, with anhydrite, from Shalkar, N. W. Himalayas.
316. Selenite, from Shalkar, N. W. Himalayas.
317. Gypsum, from Puga, Ladak; occurs associated with sulphur and potash alum, see Nos. 318 and 319. See Memoirs, Geol. Surv. of India, vol. v. p. 164.
318. Potash alum, from Puga, Ladak.
319. Native sulphur, from Puga, Ladak.
320. Native sulphur, from Barren Island, Bay of Bengal
321. Graphite, from Travancore, Madras.
322. Graphite, from Galikonda, Srungavara-pukota taluq, Vizagapatam, from the manager of the Maharajah of Vizagapatam.
323. Corundum, from South Rewah. Occurs as a thick bed in the gneiss.
324. Corundum from Coimbatoor, Madras.
324 *b*. Corundum, from Salem, Madras.
325. Gem sand, chiefly spinel fragments, from Ava.
326. Crude sapphire and ruby sand, from Upper Burmah (sent by the Burmese Committee).
327. Aquamarine in rough crystals, from Kangiam, near Coimbatoor, Madras.
328. Aquamarine, two specimens cut and polished, from Kangiam, near Coimbatoor, Madras.
329. Green avanturine quartz, from near Bellary, in Madras Presidency. Of this beautiful material large slabs and masses can be obtained.
330. Mica, from the valley of the Sankh river, in Hazaribagh district.
331. Mica, in small flakes, crystalised; sent by Madras Committee.
332. Mica, from veins in the gneiss rocks, near Gawan, Hazaribagh district; contributed by L. Carrington, Esq., C.E., East Indian Railway.
333. Borax, crude, from Puga, Ladak. Occurs with other salts as an efflorescence on the surface of the soil near hot springs.

* From Her Majesty's Gunpowder Factory, Madras. Sent by Madras Committee.

334. Carbonate of soda, crystallised, obtained from the Coimbatoor district (Vannan Karum).
335. Magnesite, from near Salem, Madras.
336. Shelly marble, from Upper Assam.
336. Shelly marble, from Garudamungalum, Trichinopoly.
337. Crystalline limestone (white), from Muddikerray, Coimbatoor district.
338. Crystalline limestone (red), from Muddikerray, Coimbatoor district.
339. Crystalline limestone (grey), from Muddikerray, Coimbatoor district.
340. Slates, roofing, from Rewarree, Goorgaon.
341. Slates, roofing, from near Dhurmsala, Kangra.
341*a*, *b*, *c*. Large platters or trays turned out of slate, from Mr. Ambler, manager of Slate Quarries, Monghyr; through Bengal Committee.
342. Potstone, turned into plates, dishes and cups; from Maunbhúm.

The larger specimens are sold at about 6*d*. each.

343. Serpentinous limestone, carved into various articles; from Tadpatry, in Bellary district, Madras Presidency. Presented by J. H. Master, Esq., Collector.
344. Articles carved in serpentine and other rocks; from Kurnool, Madras Presidency. Presented by J. H. Master, Esq., Collector.
345. Soapstone, gypsum, &c., from Kurnool, Madras Presidency.
346. O'Rileyite, from the Karen country, Burmah. Contains—

((*a*) Soluble in dilute HCl.)	
Oxide of copper	1·21
Protoxide of iron	1·97
Oxide of lead	1·89
Arsenious acid	1·12
	6·19
((*b*) Insoluble.)	
Copper	12·13
Iron	42·12
Arsenic	38·45
Antimony	·54
Earthy matters	·12
	93·36
Loss	·45
	100·00

347. Calderite, from near Hazaribagh.

A recent analysis of this mineral, in the Geological Survey Office, gave—

Silica	37·44
Sesquioxide of iron	19·38
Protoxide of iron	5·24
Alumina	6·27
Lime	30·93
Magnesia	1·40
Oxide of manganese	a trace
	100·66

The mineral being a massive lime-iron-garnet.

348. Lepidolite, pinkish, from a granite vein in mica-schist, from Pakeera, Hazaribagh district.
348. Lepidolite, pinkish, from a granite vein in mica-schist, from Pakeera, Hazaribagh district.

349. Lepidolite (grey), associated with No. 348, from same locality.
350. Lepidolite (grey), associated with No. 348, from same locality.
351. Tourmaline, green, associated with the Lepidolite.
351*a*. Tourmaline, green, associated with the Lepidolite.
351*b*. Prase, largely used in Burmah and China, where it is called Jade; sent by the Burmah Committee.
352. Apophyllite, with stilbite, from the Bhoreghat, near Bombay.
353. Apophyllite, with stilbite, from the Bhoreghat, near Bombay.
354. Apophyllite, with stilbite, from the Bhoreghat, near Bombay.
355. Stilbite, with apophyllite, from the Bhoreghat, near Bombay.
356. Stilbite, with apophyllite, from the Bhoreghat, near Bombay.
357. Heulandite, from Bhoreghat, Bombay.
358. Heulandite, from Bhoreghat, Bombay.
359. Euphyllite, with Tourmaline, on Corundum, from South Rewah.
360. Hislopite, from near Nagpoor.
360*a*. Baltimorite, from near Salem, Madras.
361. Flexible sandstone, from Kalyana, near Dadri, 50 miles N.W. of Goorgaon, Delhi; occurs in continuous layers.
362. Limestone earthy, from Edeyengoody, Tinnevelly; commonly called Edeyengoody 'chalk,' unweathered.
363. Limestone, earthy, from Edeyengoody, Tinnevelly; commonly called Edeyengoody 'chalk,' weathered.
364. Limestone, shelly, from Edeyengoody, Tinnevelly.
365. Limestone, coarse gritty, from Edeyengoody, Tinnevelly.
366. Limestone, fine gritty, from Edeyengoody, Tinnevelly.
367. Limestone, compact, from Edeyengoody, Tinnevelly.
368. Limestone, compact, of different colour.
369. Limestone from the north of Nambigar river, 16 miles to S.W.
370. Limestone, from Koodenkulam, 117 miles S.W. of Edeyengoody.
371. Gritstone, from the sea coast at Edeyengoody, coarse grit on surface, fine grit beneath.
372. Limestone, with numerous casts and moulds of *Helix vittata*.
373. Limestone, with bivalves, from Cape Comorin.
374. Sand (deep red), sand of the 'Têries,' or red sand hills, inland.
375. Sand (white), sand of the dunes, near sea coast.
376. Cape Comorin sands, 'rice sand,' uppermost.
377. Cape Comorin sands, red sand, garnets, next underneath.
378. Cape Comorin sands, black sand, magnetic iron, lowest.
379. Cape Comorin sands, the three sorts as mixed by the action of the waves.
380. Shelly limestone of the beach, Cape Comorin.
381. Recent formation on the dunes, near Edeyengoody sea beach.

The preceding collection, No. 362, &c., has been contributed to the G. S. I. by the Rev. Dr. Caldwell. The 'rice' sand, or 'fossil rice,' is said by the people to be the remains of a great feast given by the goddess Kunnia Kumari, and turned into stone miraculously.

Rock Series.

The following series is given to illustrate the geological Sections of the South Mahratta Country. They have been collected by R. Bruce Foote, Esq., Geological Survey of India, during his examination of that country.

From the gneiss series:—

382. Syenitic gneiss, from near Rollee, Kulladghi district.
382*a*. Syenitic gneiss, porphyritic, Nowlgoond. Dharwar district, Collector of Dharwar.
383. Syenitic gneiss, with veins of hornblende, from near Rollee, Kulladghi district.
384. Gritty sandstone, drab-coloured, from Buddengurh hill, Kalgatchi taluq, Dharwar district; from Collector of Dharwar.
385. Chlorite rock, from Mallur Peita Dewur, Hooblee taluq; from Collector of Dharwar.
386. Chlorite rock, from Byagudi, Hangal taluq; from Collector of Dharwar.
387. Hæmatite schist, from Mandeehal, Peita Dewur; from Collector of Dharwar.
387*a*. Hæmatite schist, from Mandeehal, Peita Dewur; from Collector of Dharwar.
388. Hæmatite schist, from Nurgoond hill; from Collector of Dharwar.
389. Hæmatite schist, from Chick Nurgoond hill.
390. Hæmatite schist, from Chick Nurgoond hill.
390*a*. and *b*. Hæmatite schist, from Ameengurh hill, Kulladghi district.
391. Red hæmatite, from Oonkal, Hooblee taluq, Dharwar district, Collector of Dharwar.
392. Brown hæmatite, with psilomelane, from Tegur; from Collector of Dharwar.
393. Mica schist, from Nurgoond hill; from Collector of Dharwar.
393*a*. Mica schist, from Nurgoond hill, Dharwar district, Collector of Dharwar.
394. Diorite, from Bhoginagar Kop, Kalgatgi taluq, Dharwar district, Collector of Dharwar.
395. Diorite, black, from Mandihal, Hooblee taluq, Dharwar district, Collector of Dharwar.
395*a*. Diorite, green, from Mandihal, Hooblee taluq, Dharwar district, Collector of Dharwar.
396. Quartzose schist, from Nowlgoond hill, Dharwar district, Collector of Dharwar.

(From the Kulladghi series:—)

397. Sandstone, white, from Munolee, Belgaum district; from Collector of Belgaum.
397*a*. Sandstone, pinkish white; from Nurgoond hill, Dharwar district, Collector of Dharwar.
398. Sandstone, gritty, purple, from Colchee hill, Ramdroog jaghire (quarried for use as hand mills).
399. Sandstone, gritty, purple, from near Koondoorgi, Kulladghi district.
400. Sandstone, friable, buff-banded, Kulladghi.
401. Quartzite, gritty, red, felspathic, from Belloor hill, Badami taluq, Kulladghi district.
402. Quartzite, felspathic, conglomeratic, from Bilgee hill, Bagulkot taluq; from Collector of Kulladghi.

403. Quartzite, pink, weathered, from Bilgee hill, Bagulkot taluq; from Collector of Kulladghi.
404. Quartzite, purple, from Moorunhal, Bagulkot taluq, Collector of Kulladghi.
405. Quartzite, felspathic, conglomeratic, from Seetamunna, Bagulkot taluq; from Collector of Kulladghi.
406. Quartzite, gritty, from Seetamunna, Bagulkot taluq; from Collector of Kulladghi.
407. Quartzite, cherty and brecciated, from Rampoor, Badami taluq, Kulladghi.
408. Quartzite, pink, from Nurgoond hill, Dharwar district; from Collector of Dharwar.
409. Quartzite, purple, from Nurgoond hill, Dharwar district; from Collector of Dharwar.
410. Quartzite, dull pink, from Chick Nurgoond hill, Dharwar district.
411. Quartzite, breccia, from Chick Nurgoond hill, Dharwar district.
411*a*. Quartzite, breccia, from Kulladghi.
412. Limestone, grey, from Munnapoor, Gokak taluq, Belgaum district; from Collector of Belgaum.
413. Limestone, grey, from Munnapoor, Gokak taluq, Belgaum district; from Collector of Belgaum.
414. Limestone, grey, from Koolgode, Belgaum district; from Collector of Belgaum.
415. Limestone, grey, from Chick Algoondi, Kuladghi; from Collector of Kulladghi.
416. Limestone, red, from Salapoor nullah, Toragul jaghire.
417. Limestone, pale pink, and green, from Bagulkot, Kulladghi district; from Collector of Kulladghi.
418. Calcspar, from Guddankerree, Kulladghi district; from Collector of Kulladghi.
419. Limestone, grey silicious, from Kulladghi, Kuladghi district.
420. Limestone, drab, white, from Kulladghi, Kuladghi district.
420*a*. Limestone, silicious, pale pinkish brown, from Kulladghi, Kulladghi district.
421. Limestone, dull pink, from Kulladghi, Kulladghi district.

(From the Bhima series :—)

422. Limestone, drab, lithographic, from Talikot, Kulladghi district; from Collector of Kulladghi.
423. Limestone, grey, from Talikot, Kulladghi district; from Collector of Kulladghi.
424. Limestone, light grey, from Talikot, Kulladghi district; from Collector of Kulladghi.
425. Limestone, drab, from Talikot, Kulladghi district; from Collector of Kulladghi.
426. Limestone, purple, from Talikot, Kulladghi district; from Collector of Kulladghi.
426*a*. Sandstone, purple gritty, from Inuchgal, Mudibihal taluq, largely quarried for millstones &c., Kulladghi district; from Collector of Kulladghi.

(From the Kulladghi series :—)

427. Slate rock, flaggy, from Kunoor, Bagulkot taluq, Kulladghi district; from Collector of Kulladghi.
428. Slate rock, flaggy, from Sillikerree, near Kulladghi, Kulladghi district; from Collector of Kulladghi.
429. Slate rock, laminar, from Sillikerree, near Kulladghi, Kulladghi district.
430. Slate rock, massive, from Sillikerree, near Kuladghi, Kulladghi district.
431. Slate rock, laminar, from Sillikerree, near Kulladghi, Kulladghi district; from Collector of Kulladghi.
432. Slate, calcareous, from Kulladghi, Kulladghi district.
433. Slate, calcareous, black green, from Kulladghi, Kulladghi district.
434 and 434*a*. Slate, calcareous banded, from Kulladghi, Kulladghi district.
435. Slate, used for hones, from Kyarturki, near Kulladghi; from C. W. Richardson.
436. Shale, buff earthy, from Kulladghi.
436*a*. Shale, purple, from Kulladghi.
437. Shale, purple banded, from Kulladghi.
438. Hæmatite schist, from Bisnal Hills, Bagulkot taluq; from Collector of Kulladghi.
439. Diorite, from a dyke in Kundurgi Valley, near Kulladghi.
439*a*. Chert, brown, with pale blue bands, Kundurghi, near Kulladghi.
439*b*. Calcareous concretion, Kulladghi.

(From the Deccan trap series :—)

440. Basalt, from One-tree-hill Quarry, Belgaum district; from Collector of Belgaum.
441. Basalt, from Moolwad, Bagehwaree taluq, Kulladghi district; from Collector of Kulladghi.
442. Basalt, from near Talikote, Kulladghi district. G. S. I.; from the Collector of Kulladghi.
443. Basalt, from Hortee Hills, Beejapoor taluq, Kulladghi district.
444. Basalt, from Hortee Hills, Beejapoor taluq, Kulladghi district.
445. Basalt, underlying the preceding, from Hortee Hills, Beejapoor taluq, Kulladghi district.
446. Bole, used as a red paint, from Baveehal, Sampgaon taluq, Belgaum district. From Collector of Belgaum.
447. Chert, grey, from Shellugi Hill, near Tulikot, Kulladghi district. From Collector of Kulladghi.
448. Chert, pinkish, from Shellugi Hill, near Tulikot, Kulladghi district; from Collector of Kulladghi.
449. Chert, grey, from Shellugi Hill, near Tulikot, Kulladghi district; from Collector of Kulladghi.

(Recent :—)

449*a*. Kunkur. Concretionary tufa formed by subaerial decomposition of calcareous shales, from Kulladghi.

Clays.

450. Pottery clay, from Rampoor, Ranigunj, used in the pottery works at Ranigunj. Sent by T. M. Robinson, Esq., Ranigunj.
451. Pottery clay, from Teelasorlee. Sent by T. M. Robinson, Esq., Ranigunj.
452. Pottery clay, from Doorgapoor. Sent by T. M. Robinson, Esq., Ranigunj.

453. China clay, from the Rajmahal Hills, Bengal.
454. Sandy clay, from Jeypoor, Assam.
455. Washed clay, from Jeypoor, Assam.
456. Washed clay, from decomposing felspathic rock, from the bed of the Numbar River, Upper Assam.
457. Washed clay, after a second washing.
458. Kaolin, from Lovedale, Nilghiri Hills. (Three specimens.)
459. Clays of various colours and degrees of fineness, from the neighbourhood of Mangalore, much used in the manufacture of tiles and common pottery by the industrial establishment of the German mission at Mangalore.
460. Kaolin, from same neighbourhood, used for pottery. G. S. I. Collection. Sent by H. S. Thomas, Esq., Collector of the South Canara district, Madras Presidency.

461. A box with 24 assorted specimens of minerals from Southern India. Sent by Dr. Bidie, Superintendent of Government Central Museum, Madras, to be given, after the Exhibition, to some museum in Vienna.
462. A box containing specimens of the building stones used in the Chanda district, Central Provinces. Sent by the Nagpore Committee.

CONTRIBUTIONS FROM OTHER SOURCES.

SECTION A.—MINERAL FUELS.

The Government borings for coal in Central India have proved successful. At a point 300 miles to the east of Bombay and 200 to the south of Nerbudda there is a well-ascertained coal-field. One of the shafts sunk has proved 52 feet of coal at a depth of 149 feet, and another 32 feet of coal at a depth of 180 feet. Every one of upwards of 20 bore-holes has also revealed coal. The area of the coal-field is as much as 60 miles in length by from 15 to 20 in breadth, and the quality of the coal is excellent for locomotive purposes.

Central Provinces Committee.

Coal from the Chanda, Belaspore, Chindwarra, and Husahu River districts.

The Local Committee remarks:—"It is believed "that the Chanda coal will be delivered at the Wardha "station of G. I. P. Railway for 18*s.* per ton. The "coals of the Belaspore and Chindwarra districts will "never find their way to market till the country is "opened up."

SECTION B.—MINERAL ORES AND METALS.

The most important and plentiful of Indian mineral ores is that of iron. The reputation which attaches to the celebrated "Wootz" will be sufficient excuse for extracting from the Asiatic Journal some particulars of its manufacture:—

"The ore from which the wootz steel is made is the magnetic oxide of iron, combined with quartz; the ore varies much in its appearance, according as the grains of quartz and oxide of iron are large or small, but the proportion in which the component parts unite is nearly uniformly 48 of quartz and 52 of oxide of iron, in 100 parts by weight.

"It is found in many parts of the south of India, but the district of Salem is the principal seat of the steel manufacture. The ore occurs generally in the form of low hills, and the quantity of it which is exposed above the surface of the surrounding country is so considerable that it is not probable that it will ever become necessary to have recourse to underground operations, supposing the smelting of iron ore from this district to be carried on to any extent that can be contemplated.

"It is prepared for being smelted by stamping and separating the quartz from it, either by washing it in a current of water, or by winnowing it in the manner in which rice is separated from the husk; in most of the deposits of ore, parts are found in which the quartz is in a state of disintegration, and these, from the greater facility with which they are broken, are always selected by the natives for their furnaces.

"The furnace, or bloomery, in which the ore is smelted, is from three to five feet high from the surface of the ground, and the ground is hollowed out beneath it to the depth of from eight inches to a foot; it is somewhat pear-shaped, being about two feet in diameter at the ground, tapering to about one foot diameter at the top; it is built entirely of clay, two men can finish one in a few hours, and it is ready for use next day. The blast is supplied by two bellows, each made of a single goat's skin, with a bamboo nozzle; the two nozzles meet in a clay pipe, which passes about half way through the furnace at the level of the ground, and by working the bellows alternately a tolerably uniform blast is kept up; a semicircular opening, about a foot high and a foot in diameter at the bottom, is left in the furnace, and before each smelting it is built up with clay. The furnace is then filled up with charcoal, and a lighted coal being introduced before the bellows, the fuel in the interior is soon kindled; as soon as this is accomplished, a small portion of the ore previously moistened with water, to prevent it from running through the charcoal, but without any description of flux, is laid on the top of the fuel, and charcoal is thrown over it to fill up the furnace; in this manner ore and fuel are added, and the bellows plied for four hours or thereabouts, when the process is stopped; and the temporary wall in front of the furnace having been broken down, the bloom is removed by a pair of tongs from the bottom of the furnace; it is then beaten with a wooden mallet to separate as much of the vitrified oxide of iron as possible, and while still red hot, it is cut through the middle with a hatchet, in order to show the quality of the interior

of the mass; in this state it is sold to the blacksmiths, who perform all the subsequent operations of forging it into bars and making it into steel.

"The process of forging the iron into bars is performed by sinking the blooms in a small charcoal furnace, and by repeated heatings and hammerings, to free it as much as possible from the vitrified and unreduced oxide of iron; it is thus formed into small bars about a foot long, an inch and half broad, and about half an inch thick; in this state the iron is full of cracks and exceedingly red short; and were an English manufacturer of steel to be told that cast steel of excellent quality could be made from such iron, he would treat the assertion with great contempt.

"It is from this unpromising material, however, that the Indian steel is always made; the bars of iron just described, are cut into small pieces to enable them to pack close in the crucible; a quantity of these pieces amounting to about half a pound, and from that to two pounds, as the mass of steel is required to be of greater or less weight, is then put into the crucible alone, with a tenth part by weight of dried wood chopped small, and the iron and wood are then covered over with one or two green leaves; the mouth of the crucible is then filled up by a handful of tempered clay, which is rammed in so close as to exclude the air perfectly.

"The wood which is always selected to furnish carbon to the iron is the *Cassia auriculata*, and the leaf used to cover the iron and wood is that of the *Asclepias gigantea*, or, where that is not to be had, that of the *Conrolvulus laurifolius*. As soon as the clay, used to stop the mouths of the crucibles, is dry, they are built up in the form of an arch, with their bottoms inwards, in a small furnace urged by two goat skin bellows; charcoal is heaped up over them, and the blast kept up without intermission for about two hours and a half, when it is stopped, and the process is considered complete; the furnace contains from 20 to 24 crucibles.

"The crucibles are next removed from the furnace, and allowed to cool, they are then broken, and the steel which has been left to solidify is taken out in a cake, having the form of the bottom of the crucible; each cake is the produce of one crucible, and the steel is never procured from a larger quantity. When the fusion has been perfect, the top of the cake is covered with striæ, radiating from the centre, but without any holes or rough projections on it; when the fusion has been less perfect, the surface of the cake has a honey-comed appearance, caused probably by particles of scoriæ and un-reduced oxide in the bar iron, and often contains projected lumps of iron still in the malleable state.

"The crucibles are formed of a red loam, which is very refractory, mixed with a large quantity of charred husk of rice; they are made by taking a lump of the tempered clay in one hand, and giving it a rotatory motion, while it is hollowed out by the fingers of the other hand: each crucible serves only for one operation.

"The natives prepare the cakes of steel for being drawn into bars by annealing them for several hours in a charcoal fire, actuated by bellows, the current of air from which is made to play upon the cakes while turned over before it at a heat just short of that sufficient to melt them. It appears from this, that in order to insure the fusion of the contents of the crucible, it is found necessary to employ a larger dose of carbon than is required to form the hardest steel, and that this excess is afterwards got rid of by annealing the cakes before a current of air at a high heat, the oxygen of the air combining with and carrying off the excess of carbon in the gaseous form; without this operation none of the cakes would stand drawing into bars without breaking.

"The only fuel employed by the natives of India throughout the different stages of iron and steel making is wood charcoal. The magnetic oxide of iron, when separated from the quartz with which it is naturally combined in the ore from which the wootz steel is made, consists of 72 per cent. of iron and 28 of oxygen. The native method of smelting the ore is so exceedingly imperfect that the produce from their furnaces in bar-iron does not average more than 15 per cent.

"I do not believe that the Indian process exercises any influence upon the quality of the steel; its only advantage appears that it enables the Hindoo to accomplish any object with the very imperfect means of applying heat within his reach, which it would be altogether hopeless for him to attempt were he to imitate the steps of the European process.

"It seems probable that the selection of particular kinds of vegetable matter to afford carbon to the iron, may not be altogether a matter of fancy. The Indian steel-maker of course knows nothing of the theory of his operations: he is satisfied with knowthat he can convert iron into steel by fusing it with what he calls "medicine," and this medicine experience has taught him must be dried wood and green leaves; and as different woods and leaves very probably contain carburetted-hydrogen in very different proportions, experience may have taught the Hindoo that he can make iron pass into the state of steel more quickly and with a smaller bulk of particular kinds of vegetable matter than with others. The *Cassia auriculata* is the only wood I have ever seen used for the purpose; it contains a large quantity of the extract called catechu; the leaf of the *asclepias* contains an acrid milky juice; the leaf of the *convolvulus* is in no respect remarkable."

Madras Committee.

Twenty-four specimens of ores and minerals; as follows:—

1. Iron sand from Camachinna pullay, Chendragherry Talook, North Arcot.
2. Gritty iron sand dug up at 2 yards depth at foot of hillocks in Cullacoorchy Talook, North Arcot.
3. Coarse iron sand dug at 5 feet depth at foot of hills in Chaitput Talook, North Arcot.
4. Coarse iron sand (uncleaned) consists of coarse grains and portions of quartz from Trenomalee Talook, North Arcot.
5. Iron ore found in the village of Chillakanamathy, Bellary.
6. Iron ore from Gootlecondah, Guntoor.
7. Oxydulous iron, native loadstone, massive, rich, Guntoor.
8. Iron sand ore from Sathinathum, Guntoor.
9. Oxydulous iron ore, magnetic with polarity, picked off surface of ground near Beypore Works, Malabar.

10. Oxydulous iron ore, magnetic in arenaceous rock, decaying into red oxide, from the Bababooden Hills.
11. Argillaceous iron ore, Ellavanasore Talook, roasted and coarsely powdered.
12 and 13. Graphite, 14 miles N.E. of Trevandrum, found in laterite at 4 or 5 feet depth.
14. Galena ore from Cattoor on the banks of Penniar near Cuddapah.
15. Copper ore, collected in the Jagheer of Garmanapentah, Nellore district.
16. Potstone, granular massive, Chittoor.
17. Corundum, Sholaseremanee.
18. Corundum, Byrahpoot, Guntoor.
19. Quartz rock, fine green colour with laminæ of mica. West of Neemkul, Rydroog Talook.
20. Baltimorite, a variety of serpentine from Salem.
21. Magnesite, carbonate of magnesia from near Salem.
22. Lithographic limestone from Kurnool.
23. Crystalline marble from behind village of Datchapully, Guntoor.
24. Serpentine found in ceded districts, Bellary.

J. T. Longley, Salem.

Nine Specimens of Ores from Salem Talook, namely:—

1. Steel ore.
2. Chromate of iron.
3. Iron ore.
4, 5. Scoriæ.
6. Oxydulous ore, magnetic, from Canjamalay.
7. Iron ore, found in river Kompandumpathy.
8. Nodules of smelted iron.
9. Octahedral crystals of iron ore.

Amritsar Local Committee.

Specimens of Párá or Simáb (Mercury), Gil-i-Armani (Armenian bole), Sankhya (arsenic), Loha Mandi, and Loha Guleri (Mandi and Guler iron), Surma (antimony), and other mineral ores and metals.

Dr. Leitner. Lahore.

Stones, samples of gold dust, &c. from Tibet and Gilgit valley.

Central Provinces Committee.

Specimens of copper ore, hæmatite, and other iron ores, smelted iron, talc, and yellow and white ochres.

The Local Committee remarks:—"All these ores "command but a local market, and being found in "wild parts of the province, the cost of transport "to a seaport would be more than their value per "ton."

Mysore Local Committee.

Specimens of charcoal, iron, and Wootz steel.

Indore Local Committee.

Sample of iron ore.

SECTION C.—OTHER MINERALS, AS SALT, SULPHUR, &c.

Madras Committee.

Specimens of salt from the South Arcot District; specimens of earth salt, and earth from which the salt is obtained from Kurnool.

Amritsar Local Committee.

Specimens of Kharya Mitti (chalk), Gandhak (sulphur), Shora Kalmi (saltpetre), Pasham sang (jade stone), Sajji (carbonate of soda), Billur (rock crystal), Hasandhup (a deposit from a mineral spring containing sulphur; the sediment is collected and made into cakes); samples of salt and other minerals.

Dr. Leitner. Lahore.

Specimen of salt from Kheora mines.

The Indian Government derives a considerable income from the Kheora mines. In its vicinity there is a mountain of gypsum, out of which, in its natural state, cups, &c. are manufactured, of which two specimens have been sent to Vienna.

Rangoon Local Committee.

Specimen of jade, specimens of sapphire and ruby sand.

Berar Local Committee.

Samples of the saline deposits found in Lake Lonar.

SECTION E.—DRAWING AND MODELS OF OBJECTS RELATING TO MINING AND METALLURGY.

Madras Committee.

Collection of mining and metallurgical tools, models, &c. from Salem, as follows:—

Models of native furnaces for smelting iron and steel, tongs and bellows used in smelting iron, and instruments for breaking and digging iron ore.

Colonel Priestley, Superintendent of the Revenue Survey Department, Madras.

Specimens of typographical maps, revenue survey maps, village maps, and plans of towns referring to various parts of the Madras Presidency.

India Museum, London.

Relief map of India, reduced half-size from map originally prepared by R. Montgomery Martin. Prepared by W. Griggs at the India Museum.

GROUP II.—AGRICULTURE, HORTICULTURE, AND FORESTRY.

SECTION I.—AGRICULTURE.

The soil and climate of India are of so diversified a nature, that the plants of almost every botanical region can be grown within its wide limits; and although the mass of the land is productive, it is largely dependent on a good system of irrigation to preserve and develop its fertile qualities. The different varieties of soils have received native names, which indicate either the means of irrigation or the nature of the soil itself; thus, land may be watered by means of wells, ponds, or canals, or it may be dependent on rain or inundation of rivers.

From the very varied nature of the climate, which at different seasons of the year partakes of the nature both of tropical and temperate parts of the world, and from the naturally corresponding diversity of vegetation, one is less surprised at the fact that the whole of India enjoys two harvests during the year, the one called the Kharif or rain crop, sown in June, before the commencement of the rainy season, and reaped at its close in October; the other, sown in October and reaped in March or April, called the Rabi crop. The latter, embracing the months which approximate in temperature to that of the seasons of cultivation in colder countries, corresponds with them also in the nature of the plants cultivated, as, for instance, wheat, barley, oats, peas, beans, vetch, lentils and gram, tobacco, flax, and plants yielding oil-seeds. In the rainy season a totally different set of plants engages the agriculturist's attention, as rice, maize, millet, sugar-cane, cotton, indigo, and most of the tropical legumes.

The Hindoos are acquainted with many, and have the merit of originating some of the improved processes of agriculture, as the rotation of crops, and the drill husbandry; but they have no knowledge of the *rationale* of rotations, or how to improve on the system they follow

The agricultural implements are of the rudest and most primitive description, differing neither in form nor material from those that have been in use from time immemorial. The Native plough is often nothing more than a crooked branch of a tree, with a piece of hard wood for the coulter; sometimes simply a forked branch with one of the forks taken off serves the native for ploughing purposes. With such implements as these, tillage becomes a mere scratching of the ground, and the fact that the soil, notwithstanding its being cultivated with such inefficient tools, bears such crops as it does, is probably due to the great amount of labour expended on it, the ground being repeatedly ploughed before sowing, especially for the Rabi, or spring crops. The average number of ploughings is six: but land intended for wheat is ploughed from 10 to 12 times, and for sugar-cane 11 to 27 times.

European influence and knowledge has effected but little improvement in the condition of the agricultural implements of India. An explanation of this is probably to be found in the fact that the ploughs and harrows of British pattern which have been introduced from time to time, are found unadapted to the inferior size and strength of the cattle generally used for farming purposes; similarly they have been shown unsuited, or at least extremely inconvenient, for the manipulation of Native labourers, who as a rule, are delicately framed, and inferior in muscular power to the Anglo-Saxon peasantry. The Natives are by no means averse to the adoption of improvements in their implements or modes of husbandry, and taken as a whole would probably be found not more bigoted in their attachment to the practices of their forefathers than English agriculturalists. As instances of Native receptivity of foreign influence it may be mentioned that the potato, which some half a century ago was but little known, is now found in every European station, and that curry, the now universally received Native standing dish, is of foreign origin, having been introduced by the Portuguese, to whom India is also indebted for some choice varieties of fruits.

Except in the neighbourhood of the Presidency capitals, where European ideas are in the ascendant, the employment of compost manure is considered a matter of small importance, the Hindoo agriculturist directing his attention almost exclusively to simple irrigation, and penning his flocks with hurdles on the land to be cultivated.

The prejudice of caste in the Hindoo, and of religion in the Mahomedan, are formidable barriers to the employment of sewage manure in the cultivation of plants for food.

Much improvement is needed in the breeding of animals for draught and burden-bearing purposes, and more especially is this the case with regard to common oxen, in which not only is a degeneracy of species, but also a decrease in numbers evident. This may be generally attributed to carelessness in breeding and inattention to pasturage. The introduction of foreign, especially English, stock is objectionable for several reasons, the chief one being that it is so long before it becomes thoroughly acclimatized.

A.—FOOD GRAINS AND PULSE.

WHEAT.

Triticum vulgare, &c.

Wheat is largely cultivated in the north as a spring crop. Dr. Royle mentions that he has not seen wheat higher than 8,000 feet, but Gerard speaks of it at 10,000, and Capt. Webb at 12,000, on the southern slope of the Himalaya. The extreme limit is given at 13,000 to 15,000 feet. The varieties cultivated in India are not many; white wheats are generally preferred. Bearded wheat is most commonly grown in the Deccan, Gujerat, and Khandeish. Wheat is much grown in the Burmese territories. The natives generally do not consume much of this grain, but it is reserved for sale. Wheat flour is mixed with the flour of some of the pulse, and in this form made into cakes, bread or cakes made of pure wheaten flour being too expensive a luxury for the mass of the population.

The following specimens are exhibited:—

952. Wheat, 1st sort. Nagpur.
953. Wheat, 2nd sort. Nagpur.

1,487–9. Wheat. Dr. G. Bidie. Madras.

A dry crop in some of the inland and higher parts of the country. Not much used as an article of food by natives of the Madras Presidency.

Composition in 100 parts:—

	Flour.	Bran.
Water	14·00	10·30
Fatty matters	1·20	2·82
Nitrogenous substances	14·60	12·48
Dextrin and sugar	7·20	5·80
Starch	59·70	22·62
Cellulose	1·70	43·98
Salts	1·60	2·52

8,781. Wheat. Dacca.
8,783. Wheat. Hugli.
8,785. Wheat. Bogra.
8,787. Wheat. Rajshahye.
8,789. Wheat. Faridpur.
8,792*a*. Wheat. Patna.
7,896. Wheat. Maunbhoom.

5,896–7. Wheat. Kattywar.
5,925. Wheat. Kantha. Kattywar.
5,926. Wheat. Daood Khani. Kattywar.
5,927. Wheat. Vanjia. Kattywar.
5,942. Wheat. Baroda.
6,043. Wheat. Dharwar.

6,075–6. Wheat. Aden.
(215.) Wheat. Surat.
6,126. Wheat. Ahmednuggar.
6,141, 6,164, 6,174. Wheat. Nassick.
6,183. Wheat. Belgaum.
6,246. Wheat. Bunsee. Mr. V. Fretwell. Khandeish.
6,247. Red wheat. Mr. V. Fretwell. Khandeish.
6,300. Wheat. Kutch.

355. Wheat and barley. Gowal Hindoo of Boobuc, Sind.
356. Kanuc Thoree wheat. Nihal Wango of Boobuc.
357. Mocharee. Vetuldass Wango. Boobuc.
358. Garee. Gowal Hindoo. Boobuc.
359. Pumbun. Thawar Wango. Boobuc.
360. Kohano. Sattoo Wango. Boobuc.
361. Wheat. Lakhoo Bunnya. Boobuc.

807. Wheat. Berar.

3,743, 3,714, 3,712. Wheat. H.H. the Maharajah of Benares.

848. Wheat. Indore.

3,331. Lal. Punjab.
3,332. Vadanak. Punjab.
3,333. Ghoni. Punjab.
3,363. Ghoni, Palampur. Kangra.
3,364. Ghoni, Kulu. Kangra.
3,365. Ghoni, Napur. Kangra.

3,402. Wheat. Kashmir.
3,608. Wheat. Oude.
2,263. Wheat. India Museum.

BARLEY.

Hordeum distichon, &c.

Barley is cultivated in the Himalayas up to 15,000 feet. There are several varieties, belonging probably to more than one species, some certainly to *Hordeum hexastichon*. The latter is said by Dr. Stewart to be frequently cultivated as a cold weather crop in the plains of the Punjab, as it requires less labour and gives more produce than wheat, even in inferior soil and where the water is deep below the surface. In some parts of the Himalayas, above 8,000 feet, it is much more common than wheat, while at lower levels it is less grown. In Lahoul and Ladak it is abundantly cultivated up to 13,000 feet, in the latter some kinds of barley may be seen to over 14,000 feet, about Haule near the Tsomoriri lake. In the plains it is frequently cut two or even

three times, when young, as fodder, with little or no injury to the ear, which is formed afterwards. In Lahoul, on the Sutlej, and in Ladak a kind of beer is made from this grain, and in the latter a kind of spirit which is used by some of the richer inhabitants. A dark purple variety of barley is cultivated near the Sutlej, and a clear translucent barley of superior quality called "paighambri." A similar naked barley is grown in Nepaul.

8,782. Barley. Dacca.
8,784. Barley. Hugli.
8,786. Barley. Bogra.
8,788. Barley. Rajshahye.
8,790. Barley. Faridpur.
8,791. Barley. Howrah.
8,792–3. Barley. Patna.

5,917. Barley. Hordeum hexastichon. Kattywar.
6,121. Barley. Hordeum hexastichon. Ahmednuggar.
6,171. Barley. Hordeum hexastichon. Nassick.
6,187. Barley. Hordeum hexastichon. Belgaum.
6,289. Barley. Hordeum hexastichon. Kolkapoor.
6,086. Barley. Hordeum hexastichon. Aden.

380. Barley. Thawur Hindoo of Boobuc. Sind.

3,742. Barley. H.H. the Maharajah of Benares.

867. Barley. Indore.

3,334. Barley, Country. Amritsur.

3,335. Barley, Fine. Amritsur.
3,366. Barley, Kulu. Kangra.
3,367. Barley, Palampur. Kangra.

3,403. Barley. Kashmir.

3,563. Barley. Oude.
2,219, 2,220. Barley. India Museum.

OATS.

Avena savita.

Oats were introduced some years ago, and are now grown sparingly at Patna and Mounghur, the original stations, and in one or two other localities, but beyond these does not seem to meet with favour, and the cultivation shows no tendency towards expansion. The paleaceous envelopes develop in greater luxuriance than in Europe to the deterioration of the grain.

954. Oats. Nagpur.
2,197. Oats. Monghyr. India Museum.

MAIZE OR INDIAN CORN.

Zea Mays.

Maize introduced into India is now widely distributed, not only in India proper, but in Burmah, and is universally employed for human food. In the Deccan, Colonel Sykes says, that the spikes are seldom allowed to ripen, while the grain is yet soft and milky the spike is taken off. It is fried or parched and eaten with ghee and pepper or sugar, when the Koonbee and his friends cannot consume in this way the produce of a field the grain is allowed to ripen and is ground into flour. Baden Powell observes in his "Punjab products," that "Maize grows "everywhere throughout the hills and appears to "flourish just as well in a temperate as in a tropical "climate. At 7,000 feet or more it is the favourite "crop of the people, and for six months of the year "forms their common staple of food. Although "superseded in the valleys by rice, there is always "a little plot of maize around the cottage of the "peasantry which is reserved for themselves, while "the rice is disposed of to wealthier classes. To "the uplands maize is an admirably suited crop. "It is very hardy, requires little rain, and is rapidly "matured. In sixty days from the day of sowing "the cobs are fit to eat, but the grain will not keep. "Weevils attack it in preference to any other grain, "and it is a popular saying that the life of maize is "only a year long."

959. Maize. Nagpur.

1,486. Maize. G. Bidie. Madras.

Used chiefly as a luxury; a garden crop.
Composition in 100 parts :—

Water - -	- 13·50
Nitrogenous substances	- 9·90
Starch and dextrin	- 64·50
Fat - -	- 6·70
Cellulose (from bran)	- 0·40
Ash - -	- 1·40

8,794–6. Maize. Patna.
8,795. Maize. Cynthia.
8,797. Maize. Shahabad.

6,904–23. Maize. Kattywar.
6,063. Maize. Dharwar.
6,082. Maize. Aden.
6,120, 6,276. Maize. Ahmednuggar.
6,255. Maize. Mr. V. Fretwell. Khandeish.
6,283. Maize. Kolkapoor.
6,295. Maize. Kutch.

388. Maize. Jumal Rutton of Karachi.

3,598. Maize. Oude.

809. Maize. Berar.

3,404. Maize. Kashmir.

3,723. Maize. H.H. the Maharajah of Benares.

855. Maize. Indore.

3,336–7. Maize, White. Amritsur.
3,338. Maize, Red. Amritsur.
3,368. Maize, Palampur. Kangra.
3,369. Maize, Kulu. Kangra.
2,265. Maize. India Museum.

CHOLUM OR JOWAREE.

Sorghum vulgare.

This grain is the most universally cultivated of any grain in the wet crop, it is in fact (in some parts) the principal support of man and beast. It will grow upon most soils, but luxuriates in the black soil (*Sykes*). There are several varieties, but principally one with red seeds, and one with white. When grown for fodder it is much more thickly sown than when grown as a grain. As a fodder plant it is highly esteemed. A single plant found growing by itself is described by Sir John Hearsay in the Journal of the Agri. Hort. Soc. of India for 1858 which produced 12,700 seeds. Some botanists recognise at least three species in cultivation, more or less, in India, viz., the present *Sorghum vulgare*, Pers., *Sorghum cernuum*, W., and *Sorghum bicolor*, Mœnch, whilst others regard these as mere varieties of the one species which is extensively cultivated over the world, and exhibits, like all largely cultivated plants, a great tendency to variation.

955. Jowaree, White. Nagpur.
956. Jowaree, Black. Nagpur.
957. Jowaree, Red. Nagpur.
1,483. Jowaree. G. Bidie. Madras.
1,484. Jowaree, Yellow. G. Bidie. Madras.

A dry crop, common article of food in various parts of the country.

Composition in 100 parts:—

Water	-	11·95
Nitrogenous substances	-	8·64
Dextrin	-	3·82
Sugar	-	1·46
Fat	-	3·90
Starch	-	70·23 { with husks.

5,908, 5,939. Jowaree. Kattywar.
5,946–50. Jowaree. Baroda.
5,982, 5,983, 5,986, 6,003. Jowaree. Sattara.
6,004. Shaloo. Sattara.
6,005. Shaloo. Sattara.
3,006. Shaloo. Kolee Jondhali. Sattara.
6,007. Shaloo. Araadee Kolee Jondhali. Sattara.
6,008. Shaloo. Kalbondee. Sattara.
6,009. Shaloo. Goolbhendi. Sattara.
6,010. Shaloo. Dagade Shaloo. Sattara.
6,011. Shaloo. Gidgab Jondhali. Sattara.
6,012. Shaloo. Redkee Shaloo. Sattara.
6,013. Shaloo. Maldandu Jondhali. Sattara.
6,014. Shaloo. Hoondya Jowaree. Sattara.
6,015. Shaloo. Sattara.
6,048. Shaloo. Dharwar.
6,049. Shaloo. Dharwar.
6,051. Shaloo. Dharwar.
6,052. Shaloo. Oolkin. Dharwar.
6,054, 6,055, 6,056, 6,057. Shaloo. Dharwar.
5,911. Shaloo. Kattywar.
6,074, 6,078, 6,087. Jowaree. Aden.
6,077. Jondhali. Aden.
(217.) Jowaree. Surat.
6,118. Jowaree. Ahmednuggar.
6,144, 6,166. Jowaree. Nassick.
6,182. Jowaree. Belgaum.
6,252, 6,249. Jondhalay. Mr. V. Fretwell. Khandeish.
6,274. Jondhalay. Ahmenduggar.
6,296. Jondhalay. Kutch.
363. Jondhalay. Tilloo Wango, Boobuc. Sind.
364. Jondhalay. Dhoolun Wango. Sind.
796. Dateala Jowaree. Berar.
797. Neramul Jowaree. Berar.
798. Adgur Jowaree. Berar.
799. Goonjal Jowaree. Berar.
800. Pierannanee. Berar.
3,721, 3,722. Pieranwanee. H.H. the Maharajah of Benares.
862. Pieranwanee. Indore.
3,586. Pieranwanee. Oude.
2,261. Jowaree. India Museum.

BAJRA OR SPIKED MILLET.

Penicillaria spicata.

The spiked millet is as common in Africa as in Asia, at a distance bearing some resemblance to our indigenous cat's-tail mace, in the form and size of its spikes. Many stems often proceed from the same root and these are from three to six feet in height. The fruit spike is dense, compact, and thicker than a man's thumb, from *six* to nine inches in length (twice as long in Africa). The seeds are obovate and compressed, so that they are largest upwards, almost in shape like a small grape stone, pearl coloured, and smooth. Except *Sorghum*, this is the most commonly cultivated grain. Roxburgh says that "it is "sown about the beginning of the rains, viz., the "end of June, and beginning of July, and is ripe in "September. It is much cultivated over the higher "lands on the coast of Coromandel. The soil it likes "is one that is loose and rich; in such it yields upwards of an hundred fold, the same ground will "yield a second crop of this or some other sort of "dry grain during Oct., Nov., Dec., and Jan."

Colonel Sykes says that it affects a reddish light gravelly or marly soil, but it is sown at times on the black soil. Under favourable circumstances one seed will produce eight stalks, each stalk furnished with a spike full of seed. Commonly, however, each seed produces only one or two good heads. From a head of ripe Bajree, growing by accident in the month of August in a field of Kodra, I obtained 2,120 perfect seeds. Supposing, therefore, eight heads to each plant, there would be 16,960 seeds, and the plant will commonly average 8,000 seeds. From a field of Bajree, repening of the 27th September, the plants average, four stalks each, each stalk with a spike of 2,175 seeds, or a return of 8,700 for one. One plant had ten stalks and 15 heads of grain.

The stalk is almost useless as fodder when dry, but cattle are sometimes fed with it when green. The seeds are considered rather heating and are used in cold weather mostly as flour. Although in Africa a kind of beer is said to be made from the malted grain, we have no record of such use being made of it in India.

1,485. Bajra. Dr. G. Bidie. Madras.

A dry crop, a good deal used as an article of food in some inland parts of the country.

Composition in 100 parts:—

Water	-	11·80
Nitrogenous substances	-	10·13
Fat	-	4·62
Starch	-	71·75

960. Bajra. Nagpur.
5,910–40. Bajra. Kattywar.
5,966. Bajra. Baroda.
6,044. Bajra. Dharwar.
6,080. Bajra. Aden.
(216.) Bajra. Surat.
6,119. Bajra. Ahmednuggar.
6,142–50–65. Bajra. Nassick
8,188. Bajra. Belgaum.
6,251. Bajra. Mr. V. Fretwell. Khandeish.
6,303. Bajra. Kutch.
6,304–5. Bajra. Bhownuggur.
362. Bajra. Gujjan Wango. Sindh.
801. Bajra. Berar.
3,741. Bajra. H.H. the Maharajah of Benares.
857. Bajra. Indore.
3,341. Bajra. Amritsur.
3,596. Bajra. Oude.
2,239. Bajra. India Museum.

ITALIAN MILLET.

Setaria Italica.

This is considered by the natives one of the most delicious of cultivated grains. It is cultivated in many parts of India, and delights in a light elevated tolerably dry soil. The seed-time for the first crop is June–July; and harvest in September. A second crop may be had from the same ground between

September and the end of January. Dr. Roxburgh states that it produces about fifty-fold in a favourable season. Dr. Ainslie writes, "This small round "grain is much prized by the native Indians of all "descriptions, who make cakes of it, and also a "kind of porridge; for the purposes of pastry it is "little, if at all, inferior to wheat, and when boiled "with milk it forms a light and pleasant meal for "invalids. The Brahmins hold it in high estima-"tion, indeed more than any other grain." In the Punjab, Baden Powell states that "this grain is "much used for feeding poultry, &c. It is very "little used as food otherwise; it is nutritious, but "is said to be heating, and apt to produce diarrhœa." This grain is commonly cultivated in the Himalaya, occasionally up to 6,500 feet. At places on the Chenab the leaves are used as a pot herb.

1,502. Setaria Italica. Dr. G. Bidie. Madras.

5,928. Setaria Italica. Kattywar.
5,979. Setaria Italica. Baroda.
6,116-22. Setaria Italica. Ahmednuggar.
6,146. Setaria Italica. Nassick.
6,185. Setaria Italica. Belgaum.
6,223-4. Setaria Italica. Mr. V. Fretwell. Khandeish.
6,284. Setaria Italica. Kolkapoor.

392. Setaria Italica. Moolo Warriram Tatta. Sind.

3,739. Setaria Italica. H.H. the Maharajah of Benares.

3,339. Setaria Italica. Amritsur.

3,374-9. Setaria Italica. Kangra.

3,407. Setaria Italica. Kashmir.

3,584. Setaria Italica. Oude.

5,905, 5,924. Setaria Italica. Kattywar.
6,299. Setaria Italica. Kutch.
2,256. Setaria Italica. India Museum.

CHENA, or INDIAN MILLET.

Panicum miliaceum.

This grain is extensively cultivated in most parts of India. In the Deccan Col. Sykes reports that it "is sown in June-July by hand, is sometimes trans-"planted, requires weeding in August-September, "and is reaped in November-December. In crops "not weeded the return was only twelve to one, but "in good seasons, and well weeded, the return "would be eighteen for one. The grain is cut "down with the 'yela,' tied up in sheaves, and "trodden out by bullocks. The straw is eaten by "cattle whilst a little grain remains in it." At Kundalleh, Colonel Sykes intimates that the yield was far greater, being equal to 192 seers for 4 seers of seed, or 48 for 1.

Dr. Stewart reports that it is common in many parts of the Himalaya up to the Indus, being most common from 3,000 up to 8,000 feet (at places on the Chenáb). It is also grown at 10,000-11,000 feet in Ladák. Its grain is considered digestible and nutritious, and in some parts is mostly consumed unground.

1,504. Panicum miliaceum. Dr. G. Bidie. Madras.

5,981. Panicum miliaceum. Baroda.
6,123, 6,278. Panicum miliaceum. Ahmednuggar.
6,147, 6,162. Panicum miliaceum. Nassick.
6,206, 6,215. Panicum miliaceum. Tanna.
6,239-40-54. Panicum miliaceum. Mr. V. Fretwell. Khandeish.
6,293. Panicum miliaceum. Kolkapoor.

3,724. Panicum miliaceum. H.H. the Maharajah of Benares.

3,340. Chinan. Amritsur.
3,376. Chinan. Kangra.

5,929. Kattywar.

3,405. Kashmir.

6,241-2. Mr. V. Fretwell. Khandeish.
2,235. Cheena. India Museum.

LITTLE MILLET.

Panicum miliare.

This millet is by no means extensively cultivated in India. It is known as *Kutki* in the Punjab, but is sparingly grown. In its uses it does not differ from the Italian and Indian millets, but is far less known It is only exhibited from two localities.

1,503. Little millet. Dr. G. Bidie. Madras.
A dry crop, grain chiefly used as a luxury. Composition in 100 parts.

Water - - -	12·22
Nitrogenous substances -	9·27
Dextrin - - -	9·13
Sugar - - -	1·80
Fat - - - -	7·43
Starch - - -	49·04
Silica - - -	0·11

966. Little millet. Nagpur.
967. Little millet, Cleaned. Nagpur.
2,236. Little Millet. India Museum.

HAIRY MILLET.

Panicum pilosum.

This is a South American species, but is cultivated to a small extent in some parts of India. Mr. Markham says that it will grow in the worst soil, but is not much cultivated unless the rains happen to be too scanty for other crops. The seed is very small, forming a long hairy spike. Colonel Sykes enumerates it amongst his Deccan plants, but states that the appellation "Bhadlee" is in some parts applied also to the red variety of *Setaria Italica*. "It "resembles 'Rahle' very much in its habit; is "hardy, requires little water, and is frequently sown "after the failure of other crops. Like 'Rahle,' its "seed is enclosed in a compact husk, which requires "to be beaten off. The seed is eaten boiled as rice, "and flour is seldom, if ever, made from it. The "straw is in little esteem as fodder." Ainslie alludes to it as being cultivated in Coimbatore, where it is eaten by the poor. It is sown in July, and reaped in October.

806. Panicum pilosum. Berar.
6,070. Panicum pilosum. Dharwar.

It is not certain that both these specimens are correctly referred to the plant above named.

BARTI.

Panicum brizoides.

This millet is uncommon in the Punjab, and seems to be scarcely known at all, except in the north of India.

3,380. Barti. Kangra.

WILD RICE MILLET.

Oplismenus colonus.

This is a small grain millet of little value, which is collected in times of scarcity to be employed as food. The plant grows wild in parts of India in sufficient plenty for this purpose. The grain is usually deprived of its husk, and then used as rice. It is one of the best grasses for forage, and is common throughout the Punjab plains. Bellew mentions that in the Peshawar Valley this seed is especially eaten during Hindu fasts, and that it, with milk, for thirty years constituted the chief food of the Akhoond of Swát, for whom it was cultivated.

2,226. Panicum colonum. Ganjam. (India Museum, London.)

SAWA MILLET.

Oplismenus frumentaceus.

Dr. Roxburgh says briefly of this plant that he had "only found it in a state of cultivation. It "delights in a light, tolerably dry rich soil; the "same ground yields two crops, between the first of "the rains in June and July, and the end of Janu- "ary. The seed is wholesome and nourishing; it "is an article of diet, particularly amongst the lower "classes of the natives, and yields about fifty-fold "in a good soil. Cattle are fond of it."

In a letter to the Agri. Hort. Soc. of India, Mr. C. B. Taylor strongly recommends this grain as being much cheaper and better than maize. It is "light and easy of digestion, it makes very palat- "able puddings, which children appear more partial "to than those made of rice, to which grain, when "boiled, it bears a striking resemblance, both as to "taste and in appearance." This grain is much less cultivated than *Panicum miliaceum.*

6,059, 6,066. Sawan. Dharwar.
6,167. Sawan. Nassick.
6,181. Sawan. Belgaum.
6,243–4, 6,253–6. Sawan. Mr. V. Fretwell. Khandeish.
6,277. Sawan. Ahmednuggar.
394. Sawan. Vynd Gool Mahomed Shah, Sehwan, Sind.
3,710. Sawan. H.H. the Maharajah of Benares.
3,344 Sawan. Amritsur.
3,578, 3,605. Sawan. Oude.
2,227. Sawan. India Museum.

KODA MILLET.

Paspalum scrobiculatum.

This is a very common and cheap grain, grown to some extent in most parts of India. Dr. Roxburgh writes of it that it delights in a light dry loose soil, but will grow in a very barren one. It is cultivated in the rainy season. The seed is an article of diet with the Hindoos, particularly with those who inhabit the mountains, and most barren parts of the country, for it is in such countries only where it is cultivated, it being an unprofitable crop, and not sown where others more beneficial will thrive. It is a very common belief that this grain is unwholesome; this was mentioned by Dr. Ainslie, and has since been often repeated. Dr. Gibson says that "a "variety of it called Hurreek often induces tempo- "rary insanity, and spasms, &c. Large numbers of "people may be occasionally be seen thus affected." Dr. Stewart writes that in the Bijnour district this grain "is said to produce cholera and vomiting, and "I find that some authors mention a similar phe- "nomenon as occasionally occurring in all three "presidencies. The natives generally hold that with "the ordinary koda, and undistinguishable from it, "grows a kind they call majna or majni, which pro- "duces the above effects, but it has been with greater "probability suggested, that these depend on the use "of the new grain under certain conditions. These "results, however, cannot be common here, as a very "intelligent old gentleman of the district informed "me that he had never seen a case."

964. Koda. Shelled. Nagpur.
965. Koda. Unshelled. Nagpur.
7,897. Koda. Maunbhoom.
5,915. Koda. Kattywar.
5,969. Koda. Baroda.
3,342. Koda. Amritsur.
3,375. Koda. Kangra.
3,406. Koda. Kashmir.
3,607, 3,613. Koda. Oude.
2,238. Koda. India Museum.

RAGGEE.

Eleusine coracana.

This grain is of great importance to the poor from its hardiness, and from the abundant return it gives. The best method of cultivation is that which is pursued with rice, but it does not require a similar quantity of water, and it is planted on spots which the farmers have not thought it advisable to appropriate to rice. It will grow on almost any soil, but the return will be proportioned to the quality of the soil and to the attention bestowed on the cultivation. (*Sykes.*)

The seeds are usually ground into flour by the handmill, this being chiefly a bread grain. The straw though tough is employed as fodder, and cattle seem to be fond of it, especially, horses, which will even prefer it to any other kind of dry forage. In the south this grain is very largely cultivated, and it extends north, over the Punjab plains to the Himalaya, where it is pretty frequent as far west as the Chenab up to 6,000 and 7,000 feet.

1,491–2. Raggee. Dr. G. Bidie. Madras.

A dry crop and highly nutritive, the chief article of food amongst the labouring classes in Mysore and other parts of southern India. It is usually stored in pits and will keep good in these for many years.

5,972. Raggee. Baroda.
6,068–9. Raggee. Dharwar.
6,115. Raggee. Ahmednugger.
6,168–9. Raggee. Nassick.
6,207–20. Raggee. Tanna.
6,301. Raggee. Kutch.
391. Raggee. Moolo Warriram Tatta, Sind.
3,725. Raggee. H. H. the Maharajah of Benares.
3,343. Raggee. Amritsur.
3,373. Raggee. Kangar.
3,574. Raggee. Oude.
2,212. Raggees. India Museum.

Eleusine stricta.

According to Roxburgh this is more cultivated than *Eleusine coracana.* It is probable that the

samples sent to Europe as Raggee belong to both species, although from the great similarity of the seeds it seems impossible to discriminate the species by their aid alone. The straight spikes form the prominent and characteristic difference in the fruiting plants. This is considered the most productive species of the two. Roxburgh writes of a specimen which came up accidentally amongst some rubbish in his garden at Samalcottah, two tufts of this plant, each upon examination he found to be the produce of one seed, each had twenty-five culms, and each of these culms had on an average two lateral branches, making in all seventy-five culms and branches, each produced on an average six spikes (for they had from four to eight) in all four hundred and fifty spikes; each of these had at a medium sixty spikelets, and each spikelet ripened on a average three or four seeds, making a total produce of 81,000 grains.

2,213. Eleusine stricta. India Museum.

JOB'S TEARS.

Coix lacryma.

Under the name Eejin or Ee-yin the seeds of this grass are used in China and Malacca. It is most remarkable amongst food grains for its chemical composition. Dr. Smith writes that, "it is larger "and coarser than pearl barley, but is equally good "for making gruel. As it is sold for fivepence per "Chinese pound it makes an excellent diet drink for "hospital patients in China." Dr. Hooker observes that, "a great deal of *Coix* is cultivated in the Khasia "Hills; the shell of the cultivated sort is soft and "the kernel is sweet, whereas the wild *Coix* is so "hard that it cannot be broken by the teeth; each "plant branches two or three times from the base, "and from seven to nine plants grow in each square "yard of soil; the produce is small, not above 30 "or 40 fold." In Mason's "Burmah" it is stated that a species of *Coix*, with large esculent seeds, which are parched like Indian corn, are often for sale in the bazaars, and are cultivated very extensively by the Red Karens.

2,204. Ee-yin. India Museum, London.

BAMBOO GRAIN.

Bambusa arundinacea, and other species.

Bamboo grain has considerable resemblance to oats, and is collected in some localities as food by the poorer classes in times when other food grains are scarce and dear. Mr. Blechynden, in a letter published in Agri. Hort. Soc. of India Journal, gives particulars of the service rendered by this grain after failure of the rice crops in Orissa in 1812, when a general famine was apprehended. "The grain ob-"tained from the bamboo was most plentiful and "gave sustenance to thousands; indeed, the poorer, "and therefore the greater portion of the inhabitants "subsisted for some time solely on this food. So "great was the natural anxiety that was evinced to "obtain the grain, that hundreds of people were on "the watch day and night, and cloths were spread "under every clump to secure the seeds as they "fell from the branches."

1,490. Bamboo grain. Dr. G. Bidie. Madras.

Eaten by jungle tribes, and also by others in times of scarcity.

2,198. Bamboo seed. India Museum.

NANOGEE.

This is a grass seed which has been supposed to be that of *Festuca fluitans*, doubtless in error, employed as a food grain in Sind. It much resembles the seed of Canadian wild rice (*Zizania*).

390. Nanogee. Purmanund Kelty. Karachi.

RICE.

Oryza sativa.

of which there are innumerable varieties, is the favourite food grain of the people, but with the exception of Arracan and a few other districts in which it constitutes the chief and almost only article cultivated, its use is confined to the richer classes throughout the country. It grows readily on low lands, which are well irrigated, heat and moisture being the two great essentials for its development. There are three modes of culture:—The first and simplest consists in sowing the seed broadcast in its natural state. In unirrigated lands this method is universally followed. In the second, the seed is steeped and then forced under warm grass to germinate. The seed with the tender shoots is then thrown into the soil which has previously been flooded to receive it. This method prevails wherever water is abundant. In the third the crop is raised in a nursery, and when about a month old the young plants are planted out at stated intervals, in a well-flooded field. This system of transplanting involves a great deal of trouble and is only followed in heavy swampy ground where the plough cannot work, although by it, the yield of rice is greater than by any of the other methods. These modes of cultivation are followed in the Kangra Valley in which the celebrated "básmati" rice is grown. Another celebrated variety is the "vara" or scented rice, which is grown exclusively on lands irrigated by the river Bara, in the Peshawur Valley. The rice crop is sown in May or June and reaped in October.

Paddy and Rice from Bengal.

(Oryza sativa.)

Varieties of Rice from Hugli.

4,883. Atap.
4,884. Dádkháni.
4,885. Bénáphul.
4,886. Noná.
4,887. Rámsál.

Varieties of Rice from Rajshahye.

4,888. Borochal.
4,889. Motachal. "Fat rice."
4,890. Benaphul Atap.
4,891. Motá aush "Fat autumn crop rice."
4,892. Dádkháni ushna.
4,893. Benáphul ushna.
4,894. Madhu mádhab átap.
4,895. Motá aush.

Varieties of rice from Chittagong.

4,896. Bánsphul atap.
4,897. Turia beti.
4,898. Matahari.
4,899. Naricel chomar.
4,900. Beti (a coarse kind of Callam).
4,901. Lotha bini.
4,902. Aush (autumn crop).
4,903. Gring.
4,904. Agpránia sál.

4,905. Balwar.
4,906. Madhu malut (a scented rice).
4,907. Turia bing.
4,908. Camal bhog.
4,909. Tilack kistore.
4,910. Juta Beti (False Beti).
4,911. Lhambru.
4,912. Maidul.
4,913. Parpá.
4,914. Dud kamal (Milk lotus).
4,915. Dhulpátá.
4,916. Chamalaish beti.
4,917. Bigun bichi (Brinjal seed).
4,918. Rái sál.
4,919. Mahi jhamari.
4,920. Galong.
4,921. Kharai papra.
4,922. Cola bile.
4,923. Sona mukhi (Gold faced).
4,924. Bhutiá galong.
4,925. Boro bini.
4,926. Nuna sál.
4,927. Chini chákul.

Varieties of Rice from Howrah.

4,928. Rádhuni pagol (Cook maddening).
4,929. Haimanti.
4,930. Amarta sál.
4,931. Rámsál.
4,932. Parmanna bhog.
4,933. Kámini.
4,934. Muni bhog (Food for ascetics).
4,935. Gándha málati.

Varieties of Rice from Sarun.

4,936. Atáp.
4,937. Dádkháni.

From 24-Parganas.

4,938. Pátnái (from Patna).
4,939. Bánktulsi.

From Balasore.

4,940. Dádkháni.

Varieties of Rice from Cynthia.

4,941. Hemcharanga.
4,942. Rámsál.
4,943. Mota dhan (Fat paddy).
4,944. Kurruckchoo.
4,945. Mohipal (Ruler of the world).
4,946. Ramsahal.

From Rajshahye.

4,947. Amn dhan, winter paddy.

Varieties of Paddy from Attia.

4,948. Parijat (Flower in Indrás garden).
4,949. Bánkosh.
4,950. Kalijirá.
4,951. Mahesh kál dhánya.
4,952. Pákhiráj (King of the birds).
4,953. Sháil soná jheel.

Varieties of the Aush or Spring paddy from Faridpur.

4,954. Cháttrabhog.
4,955. Dunarguda.
4,956. Málika.
4,957. Sámudra féna (Sea froth).
4,958. Dudmáni (Milk jewel).
4,959. Lepa.
4,960. Ghí kai.
4,961. Dud sál.
4,962. Koomrail.
4,963. Akáshmáni (Sky jewel).
4,964. Bonorám.
4,965. Kautuk máni (Amusement jewel).
4,966. Bénaphul, a sweet scented rice).
4,967. Pora binni.
4,968. Kála tope (Black cap).
4,969. Saudamini (Lightning).
4,970. Pipra bálam.
4,971. Suryamani (Sun jewel).
4,972. Manic muktá (Jewel pearl).
4,973. Lohasala.
4,974. Piprail.
4,975. Sasaful (Cucumber flower).
4,976. Jamura.
4,977. Shádo.
4,978. Kalabhog.
4,979. Pájra.
4,980. Lakshi kajal.
4,981. Chintamáni (Anxiety jewel).
4,982. Kalamándraj.
4,983. Hingul.
4,984. Kappur.
4,985. Sindur kánta.
4,986. Sultan chápa.
4,987. Baulam.
4,988. Kabbir málik.
4,989. Bailabotor.
4,990. Sonakakai.
4,991. Pákshiraj.
4,992. Koch mangal.
4,993. Komrail.
4,994. Kapna.

Varieties of the Amn or Winter paddy from Faridpur.

4,995. Bhogankápur.
4,996. Narikel bandha.
4,997. Bansiraj.
4,998. Kartic sál.
4,999. Manibhog.
5,000. Kaladigha.
8,372. Lonabetholia.
8,373. Lohachoora.
8,374. Mandraj (King of mountains).
8,375. Jhinga sal.
8,376. Asvena bayera.
8,377. Nalcha.
8,378. Sonadigha.
8,379. Kala bayera.
8,380. Jhul.
8,381. Hijuldigha.
8,382. Lakhisala.
7,663. Kauch kalom.
7,664. Poda malika.
7,665. Rangi nalach.
7,666. Dudraj (Milk kingdom).
7,667. Sindur kanta.
7,668. Muktahar (Pearl necklace).
7,969. Bagrail.
7,670. Gila matia.
7,671. Madhu sail.
7,672. Dálkachu.
7,573. Jalanghi.
7,674. Dudsar.
7,675. Gazibho.
7,676. Jawalbho.
7,678. Honumanjata (Hanuman's matted hair).
7,679. Dudbhárni.
7,680. Sita nabbai.
7,681. Notha sál.

7,682. Makomra.
7,683. Kanak chuda.
7,684. Parmanna mukta (Parmanna pearl).
7,685. Goerbagha.
7,686. Mahish kaim.
7,687. Pitraj
7,688. Bhoglaskar.
7,689. Madhabjata.
7,690. Pankaich.
7,691. Goathobi.
7,692. Digha.
7,693. Bagha.
7,694. Khaia murki. This when mixed with goor forms Murki which is largely consumed especially by the lower orders.

Varieties of the Boro or Long grained Paddy, from Faridpur.

7,695. Kaijury.
7,696. Godisvar.
7,697. Parangi.
7,698. Saita.
7,699. Kedarchak.
7,700. Deyshi rayda.

Varieties of Paddy from Bogra.

7,701. Saluga.
7,702. Loharduga.
7,703. Pani sail.
7,704. Beragaujica.
7,705. Kesar kuli.
7,706. Khalsi.
7,707. Dankamari.
7,708. Singradal kachu.
7,709. Janakrai.
7,710. Kalas Sabunga.
7,711. Salas khan.
7,712. Garpa.
7,713. Satia.
7,714. Kali sail.
7,715. Sankar mugi.
7,716. Chitri.
7,717. Gajalgaria.
7,718. Madar jata dhare (Gentle holder of matted hair).
7,719. Kankuyá.
7,720. Banla.
7,721. Kanakchur.
7,722. Dhalagaria.
7,723. Haruya magura.
7,724. Ban saon.
7,725. Kada loch.
7,726. Saral bansi (Even flute).
7,727. Kasia pánja.
7,728. Bakri.
7,729. Balun.
7,730. Kalagaria.
7,731. Sukaraj saluya.
7,732. Mahish bathan saluya.
77,33. Benaphul.
7,734. Arail.
7,735. Pankhiráj.
7,736. Jamras.
7,737. Halidajaun.
7,738. Pakra.
7,739. Sal khajura.
7,740. Fulgangia.
7,741. Kesargauchi.
7,742. Suryamáni.
7,743. Dabar sail.
7,744. Chaupalo.
7,745. Mahesachura.
7,746. Achpál.
7,747. Raimugi.
7,748. Chanturul.
7,749. Changamáguri.
7,750. Galadária.
7,751. Paniamáguri.
7,752. Jailjáta.
7,753. Mági.
7,754. Bir madla.
7,755. Kayar vog.
7,756. Nagdum.
7,757. Baugal bákri.
7,758. Bánia mují.
7,759. Dhenpa.
7,760. Hanskol.
7,761. Khir sabád sálnya.
7,762. Beto.
7,763. Jhubri.
7,764. Gaiahár.
7,765. Gyalka.
7,766. Sátia.
7,767. Dánki sál.
7,768. Mail sára.
7,769. Sulí.
7,770. Ukhan mádhu sálnya.
7,771. Mugí.
7,772. Kaláganchi.
7,773. Bánsi.
7,774. Asina.
7,775. Khumán.
7,776. Bánsphul sálnya.
7,777. Dálkachu.
7,778. Pánthi.
7,779. Akarchaul.
7,780. Bilatkalam.
7,781. Khapakari.
7,782. Cansakalam.
7,783. Padmanál.
7,784. Kanchanáni.
7,785. Kumar.
7,786. Tilkaful.
7,787. Mahisnáti.
7,788. Garia.
7,789. Appchia.
7,790. Sulfain.
7,791. Dhenpa.
7,792. Senurkatnya.
7,793. Pani jail.
7,794. Jata.

Varieties of Rice from Faridpur.

8,731. Kalma.
8,732. Rassi.

Varieties of Paddy from Faridpur.

8,733. Bagra.
8,734. Paddy.
8,735. Paddy.
8,736. Paddy.

Varieties of Paddy from the 24-Parganas.

8,737. Pátnái.
8,738. Banktulsee.

Varieties of Paddy from Attia.

8,739. Pakhiráj.
8,740. Radhuni pagol.
8,741. Tulshi mala.
8,742. Dhaki dudshar.
8,743. Nardai.

Paddy from Balasore.

8,744. Dhán.

Varieties of Paddy from Pubna.

8,745. Runeah.
8,746. Náta.
8,747. Khaen.
8,748. Degha.
8,749. Naugoll.
8,750. Aush.

A seed from Chylhet.

8,751. Chini.

Varieties of Rice from Shahabad.

8,752. Banktulsee.
8,753. Coarse rice.

Varieties of Rice from Sylhet.

8,754. Mota dhan oosua.
8,755. Goary.
8,756. Sookdas.
8,757. Kalijira.

Varieties of Paddy from Sylhet.

8,758. Goosamon.
8,759. Chingry.
8,760. Boona.
8,761. Kalijira.
8,762. Salburah.

Varieties of Paddy from Patna.

8,763. Ashini.
8,764. Shilák.
8,765. Kártic.

Varieties of Rice from Moorshedabad.

8,766. Bánsphul (Bamboo flower).
8,767. Lonasal.

Varieties of Paddy from Moorshedabad.

8,768. Benegota.
8,769. Kájulgowie.
8,770. Bánsphul.
8,771. Rájkutkee.
8,772. Jhingasál.
8,773. Nágrasál.
8,774. Sodasál.
8,775. Lonasál.
8,776. Doolakutkee.
8,777. Autkooly.
8,778. Kálmar.
8,779. Sonásál.
8,780, 310. Párbut jira.

Paddy from Rajshahye.

8,811, 340. Motá dhánare gách.
8,812, 341. Benáphul dhánare gách.
8,813, 342. Dadkhanee dhánere gách.
8,814, 343. Bansphul dhánere gách.

Paddy from Balasore.

8,819, 348. Dhánare gách.

Rice and Paddy from Maunbhoom.

7,889, 581. Ramshali.
7,890, 582. Bans moti.
7,891, 583. Paramaisalli.
7,892, 584. Goradhani.
7,893, 585. Kasiphul.
7,894, 586. Hathipaujar.
7,895, 586. Dhusari.

Rice from Burdwan.

7,909, 601. Radhunipagol.
7,910, 602. Nuna.
7,911, 603. Loghoo.
7,912, 604. Bongota.

3,640. Kupoorsur Rice. Allahabad.
3,641. Hirunjee Rice. Allahabad.
3,642. Kulwa Rice. Allahabad.
3,643. Lohundee Rice. Allahabad.
3,644. Hunsraj Rice. Pilibheet.
3,645. Basmuttee Rice. Pilibheet.
3,706. Rice. Maharajah of Benares.
3,707. Rice. Bhorijza. Maharajah of Benares.
3,708. Rice. Jathi. Maharajah of Benares.
3,709. Rice. Jathi. Maharajah of Benares.
1,493. Pootta Arisha. Dr. G. Bidie. Madras.
1,494. Karoopu Poottu. Dr. G. Bidie. Madras.
1,495. Sirra Manee Nelloo. Dr. G. Bidie. Madras.
1,496. Pesanum Nelloo. Dr. G. Bidie. Madras.
1,497. Sembalay Nelloo. Dr. G. Bidie. Madras.
1,498. Candia Calootan Nelloo. Dr. G. Bidie. Madras.
1,499. Chinna Sumba Nelloo. Dr. G. Bidie. Madras.
1,500. Vaudum Sumba Nelloo. Dr. G. Bidie. Madras.
1,501. Nelloo. Dr. G. Bidie. Madras.

A universal wet crop in Southern India and the most general article of food amongst all classes. Composition in 100 parts:

Water - -	14·000.
Nitrogenous matters	7·242.
Gum or Dextrin	1·570.
Sugar - -	0·390.
Fat - -	0·900.
Starch - -	75·918.

3,561, 3,565, 3,567, 3,585. Rice. Oude.
3,591, 3,600, 3,602, 3,604. Rice. Oude.
3,616, 3,625, 3,626, 3,628. Rice. Oude.

Very many varieties of rice are grown in Oude. A heavy soil and plenty of water suits them best. There are five kinds which are considered among the best; "Mihee" and "Bansee" are foremost. The peculiarity in the cultivation of these two kinds is, that they are transplanted and placed about 5 inches apart. And, by this method, if the soil is good, they grow to the height of an ordinary sized man, and produce a much larger quantity than if otherwise treated. The odour and flavour of these two kinds, when cooked, are superior to those of any other kind. They are only used by those who can afford to buy them.

As the labour in cultivating them makes them dearer than the other sorts, the three other varieties which are considered good are the "Bateesa," the "——" and the "Phool-Biring." They are sown broad-cast in June, and left so, and they are the kinds mostly used by natives. The first two mentioned, when new, sell for 10 or 12 seers per rupee, and become dearer according as they become older. The other three kinds sell for about 19 seers per rupee, and are dearer if older. Some consider "Phool-Biring" the best, as it swells in boiling, and has an agreeable odour.

365. Chawuur Sindee. Kadur Bux Urzee of Soopur. Sind.

366. Sookdasee. Kadur Bux Urzee of Soopur. Sind.
367. Sutria. Kadur Bux Urzee of Soopur. Sind.
368. Timnia. Mahmood Julbanee, Shahbunder. Sind.
369. Paddy. Mahmood Julbanee, Shahbunder. Sind.
370. Rice, Ghogharee. Jaro Manjun, Gogaree. Sind.
371. Paddy. Jaro Manjun, Gogaree. Sind.
372. Namdasee Rice. Purmanund Ketty Karachi.
373. Namdasee Paddy. Purmanund Ketty Karachi.

374. Sindee Rice. Chuttoo Kuddoo. Meerpoor.
375. Sindee Paddy. Chuttoo Kuddoo. Meerpoor.
376. Sookdasee Rice. Chuttoo Kuddoo Meerpoor.
377. Sookdasee Paddy. Chuttoo Kuddoo Meerpoor.
378. Khorwa. Ramchand of Khorwa.
379. Rice. Ramchand of Khorwa.

804–5. Rice. Berar.
811. Rice. Badlee. Berar.

856. Paddy. Indore.
876. Rice. Indore.

3,345. Chonna. Amritsur.
3,346. Basmatti. Amritsur.
3,347. Sathi. Amritsur.
3,370. Paddy. Kangra.
3,371. Paddy. Kangra.
3,372. Paddy. Kangra.
919. Rice, Chinnoor, 1st sort. Nagpoor.
920. Rice, Chinnoor 2nd sort. Nagpoor.
921. Rice, Ramkail. Nagpoor.
922. Rice, Pisor. Nagpoor.
923. Rice, Kali-kamode. Nagpoor.
924. Rice, Sukdoss. Nagpoor.
925. Rice, Dood Ramkail. Nagpoor.
926. Rice, Ghondhu. Nagpoor.
927. Rice, Mahur Deta. Nagpoor.
928. Rice, Bhera Rambar. Nagpoor.
929. Rice, Rota Chinga. Nagpoor.
930. Rice, Nageshwar. Nagpoor.
931. Rice, Chinga. Nagpoor.
932. Rice, Wanwaloo. Nagpoor.
933. Rice, Jhulan. Nagpoor.
934. Rice, Nanghu. Nagpoor.
935. Rice, Gorrad. Nagpoor.
936. Rice, Ramkajul. Nagpoor.
937. Rice, Belodia. Nagpoor.
938. Rice, Hira nakhi. Nagpoor.
939. Rice, Karinjah. Nagpoor.
940. Rice, Ghara Puch. Nagpoor.
941. Rice, Pota chinga. Nagpoor.
942. Rice, Carolina. Nagpoor.
943. Rice, Niri Sarh. Nagpoor.
944. Rice, Chipra. Nagpoor.
945. Rice, Nageswar 2nd sort. Nagpoor.
946. Paddy. Nagpoor.
5,898. Rice. Kattyawar.
5,912. Paddy. Kattyawar.
5,916. Rice, Sootarsal. Kattyawar.
5,918. Paddy, Wurree Douger. Kattyawar.
5,919. Rice, Jeeresal. Kattyawar.
5,920. Rice, Bodika mode. Kattyawar.
5,921. Rice, Alaichee. Kattyawar.
5,922. Rice, Trumpankhdina. Kattyawar.
5,943. Paddy, Baroda.
5,949. Paddy, Kunar. Baroda.
5,963. Paddy, Elichee. Baroda.
5,968. Paddy, Baroda.
5,974. Paddy, Barja. Baroda.
5,980. Coloured rice. Baroda.
5,987. Paddy, Kalisal. Sattara.
5,988. Rice. Sattara.
5,989. Rice, Ambemohar. Sattara.
5,990. Rice. Sattara.
5,991. Rice, Takache. Sattara.
5,992. Rice, Patnee. Sattara.
5,993. Paddy, Joza. Sattara.
5,994. Paddy, Chimausal. Sattara.
5,995. Paddy, Sattara.
5,996. Paddy, Vurngal. Sattara
5,997. Paddy, Goodha vurgal. Sattara.
5,998. Paddy, Roy bhoga. Sattara.
5,999. Paddy, Mangarval. Sattara.
6,000. Paddy, Tamsal. Sattara.
6,001. Paddy, Khabootray. Sattara.
6,002. Paddy, Dodkay. Sattara.
6,016–7. Rice, Dharwar.
6,018–9. Paddy. Dharwar.
6,020. Paddy, Badami sali. Dharwar.
6,021. Paddy, Hakala sali. Dharwar.
6,022. Paddy, Kunkama sali. Dharwar.
6,023. Paddy. Dharwar.
6,024–9. Rice. Dharwar.
6,031. Paddy. Dharwar.
6,032. Paddy, Kagi sali. Dharwar.
Paddy, Kelwel. Surat.
Paddy, Kuda. Surat.
Paddy, Sookhool. Surat.
Paddy, Salive. Surat.
Paddy, Elachee. Surat.
6,125. Rice. Ahmednuggar.
6,138, 6,151, 6,170. Paddy. Nassick.
6,143, 6,152, 6,172. Rice. Nassick.
6,178, 6,180, 6,190. Rice. Belgaum.
6,191. Paddy, Sukal. Tanna.
6,192. Paddy, Tamsal. Tanna.
6,193. Paddy. Tanna.
6,194. Paddy, Welchee. Tanna.
6,195. Paddy, Dodka. Tanna.
6,196. Paddy, Tamsal. Tanna.
6,197. Paddy, Ambamohar. Tanna.
6,198. Paddy, Bodka. Tanna.
6,199. Paddy, Rajaval. Tanna.
6,200. Paddy, Kolumba. Tanna.
6,201. Paddy, Gurwa. Tanna.
6,202. Paddy, Bhadas. Tanna.
6,203. Paddy, Kharidangi. Tanna.
6,204. Paddy, Lakood gurwa. Tanna.
6,205. Paddy.
6,233. Paddy, Kumode. Mr. V. Fretwell. Khandeish.
6,234. Rice, Kumode. Mr. V. Fretwell. Khandeish.
6,235. Indigenous paddy. Mr. V. Fretwell. Khandeish.
6,236. Indigenous rice. Mr. V. Fretwell. Khandeish.
6,237. Carolina paddy. Mr. V. Fretwell. Khandeish.
6,238. Carolina rice. Mr. V. Fretwell. Khandeish.
3,390. Rice, Shali. Kashmere.
3,391. Kannu. Kashmere.
3,392. Basmatti. Kashmere.
3,393. Baraz. Kashmere.

3,394. Kuthichan. Kashmere.
3,395. Gureh. Kashmere.
3,396. Shir-e-mal. Kashmere.
3,397. Genzer. Kashmere.
3,398. Mushk-i-bodz. Kashmere.
3,399. Larbewal. Kashmere.
3,400. Pont barari. Kashmere.
3,401. Mukhta. Kashmere.

The Burmese recognise nearly a hundred varieties of rice, but the principal distinctions between the different kinds are as follows:—Hard grain, soft grain, glutinous rice.

The "Natsieng" is the hardest grain, and is the rice which is accordingly principally exported to Europe.

The "Meedo" is the chief of the soft grain varieties. It is much preferred by the Burmese to the hard-grained sorts, and it is certainly superior in taste when cooked; but the hard-grained rice is chiefly purchased by the merchants for export, as it keeps better, and the soft-grained rice is too much broken by European machinery in cleaning. Latterly, on the continent, this last objection appears to have been overcome, and a greater demand is consequently springing up for the "Meedo" rice for the markets of foreign Europe.

The "Koungnyeen," or hill rice, is called "glutinous" rice by Europeans, from the property it possesses, when cooked, of the grains all adhering in a thick glutinous mass. It is the chief article of food with the Karens and other hill tribes, but is not much eaten by the inhabitants of the low swampy plains, where the common rice is grown.

8,940. Ngakyouk. Paddy. Rangoon.
8,941. Ngakyouk. Five parts cargo rice. Rangoon.
8,942. Ngakyouk. White rice. Rangoon.
8,943. Ngatsein. Paddy. Rangoon.
8,944. Ngatsein. Five parts cargo rice. Rangoon.
8,945. Ngatsein. White rice. Rangoon.
8,946. Meedong. Paddy. Rangoon.
8,947. Meedong. Five parts cargo rice. Rangoon.
8,948. Meedong. White rice. Rangoon.
8,949. Bassein. Paddy. Bassein.
8,950. Bassein. Paddy. Bassein.
8,951. Bassein. White rice. Bassein.

The Paddy samples show the grain as brought into the mills by the cultivators.

The samples of five parts cargo rice show the grain as prepared for shipment to the European markets.

The samples of White rice show the grain as prepared for local consumption and for export to Singapore, China, the Madras Coast, and (occasionally) to the West Coast of South America.

2,229. Carolina Paddy, seed obtained from the United States, and introduced into India. *India Museum, London.*

BUCKWHEAT.

Fagopyrum esculentum, and other species.

This food grain, said to have been originally brought from Central Asia, is found sparingly cultivated in the Himalayas. It grows at about 6,000 feet, according to Dr. Stewart, on the Jhelam; 5,000 to 10,000 on the Chenab and Ravi; 8,000 to 9,000 on the Bias; and on the Sutlej it is grown commonly to 11,500; Gerard states that he has seen it at 13,600 feet. Thomson notes it at 13,000 feet in Zanskar; and Cayley mentions it as cultivated to 14,000 feet in Ladak, where Dr. Stewart saw it to over 13,500. In Lahoul, Aitchison says that the leaves are much used as a pot herb in summer, when other greens are not easily got. One or two other species are believed to be cultivated in the same region for the same purposes. Buckwheat is occasionally seen as a cultivated product in the Deccan, the grain being eaten toasted as a fast-day food by the Hindoos.

2,381. Buckwheat. Kangra.
3,419. Buckwheat. Kashmire.
3,436. Buckwheat, Taramba. Kashmire.
3,216. Buckwheat. India Museum, London.

RAJGEERA.

Amarantus frumentaceus.

Dr. Wight writes of this species that it is much cultivated on the slopes of the higher hills in several districts of Southern India. In Coimbatore, Salem, and Madura, he had frequently met with large fields of it, often on very steep slopes. In such situations it often grows upwards of six feet high. The seed ground into meal forms the principal food of the wild inhabitants of the hills. Several species of Amarantus are found in the hilly districts of Northern India, where the leaves are eaten as a vegetable, and the seeds as grain. Dr. Jameson mentions two species cultivated at Kullú.

861. Amaranth. Indore.
3,386. Amaranth. Kangra.
3,420. Amaranth. Kashmir.
2,194. Amaranth. India Museum, London.
3,592. Amarantus anardana. Oude.

SAWNEE.

Under the name of *Sawnee*, and referred to *Achyranthes lappacea*, Roxb., as its source, this seed has been sent amongst food grains from Sind with no further information.

389. Sawnee. Kacha Talooka Dadoo, Sind.

CHENOPODIUM QUINOA.

Introduced into India from South America for cultivation on the slopes of the Himalayas. The seeds are used as a food grain, and the leaves as a vegetable. This is considered a most valuable food plant in Peru, where it has been cultivated from time immemorial. Seed was distributed along the Himalayas, and in the Neilgherries, but no grain, the produce of these sowings, has yet been sent to Europe. The sample exhibited is a portion of that obtained from South America and sent out to India for experimental cultivation.

2,202. Quinoa. India Museum, London.

Portion of the seed despatched to India for experimental cultivation.

CAJAN PEA.

Cajanus Indicus.

There are numerous varieties of this pea, which is most extensively grown in almost all parts of India. It is sown in the fields at the commencement of the rains in June, and is ripe in December. The young and green pods are used as a vegetable. The seed is split to form Dál, and is used in soups; or it is parched, especially the black variety; or it

is ground into meal and mixed with wheat flour made into cakes. The leaves and pods, after the seed is removed, are used as fodder. Sir Walter Eliot says that this pulse when split is in great and general esteem, and forms the most generally used article of diet among all classes. It is chiefly eaten mixed with rice, a mess known as "khichri" vulgo "kedjari." Roxburgh assigns to it a comparative value in native estimation after *Phaseolus radiatus*, to which he gives the first place, and *Cicer arietinum*, or Chick pea, which he reckons the second. But as far as the general and daily use of the several kinds may be taken as an indication of taste, the *Cajanus*, or Pigeon pea, must be considered as number one.

1,525. Cajan Pea. Dr. G. Bidie. Madras.

Largely eaten in the roasted state, more especially by Sepoys on the march. Composition in 100 parts:—

Water - - -	10·63
Nitrogenous substances -	22·18
Fat - - -	1·95
Starch - - -	62·13
Mineral matters - -	3·11

958. Toor. Nagpur.
969. Toor, Dal. Nagpur.

8,803. Toor. Howrah.
8,816. Toor. Balasore.
7,906. Toor. Maunbhoom.

5,937. Toor. Kattywar.
5,957. Toor. Baroda.
6,039, 6,047. Toor. Dharwar.
(219.) Toor. Surat.
6,137. Toor. Ahmednuggar.
6,158. Toor. Nassick.
6,175. Toor. Belgaum.
6,216. Toor. Tanna.

6,225, 6,230. Toor. Mr. V. Fretwell. Khandeish.

3,564, 3,573. Toor. Oude.

802. Toor. Berar.

3,733–4. Toor. H.H the Maharajah of Benares.

845. Toor, Dal. Indore.

3,361. Toor. Amritsur.
3,385. Toor. Kangra.
2,200. Toor. India Museum.

GRAM, or CHICK PEA.

Cicer arietinum.

The chick pea is largely cultivated, and much esteemed in India as an article of diet, and also as food for cattle. There are three distinct varieties according to the color of the seed; the white seeded, the brown seeded, and the black seeded. The latter appears to be by no means common. The natives use the seeds parched and ground mixed with wheat flour. Split it constitutes one of the Dals. The green grain eaten raw is called Solaneh. The haulm is used as fodder. Colonel Sykes examined a middle-sized plant collected at Gunnehgoon, and found upon it 116 fine pods, some containing three, others two, and some one seed, altogether 170 seeds. This pulse does not appear to be much cultivated in the hill tracts of the North. Barnes says a belief is current in the hills that "there is some affinity in "the grain field which attracts the lightning, and, "after a storm he had certainly observed whole "tracts scorched and destroyed as if by fire." Some attempts have been made to grow gram in Britain, but the climate does not seem to be suitable for the perfection of the seeds in ordinary seasons, although ripe seeds have been produced. Fine large seeded varieties are grown in Spain.

1,513–4. Gram. Dr. G. Bidie. Madras.

In the northern parts of India used for feeding horses, instead of grain.

Composition in 100 parts:—

Water - - -	11·39
Nitrogenous matter -	22·70
Fat - - -	3·76
Starch - - -	63·18
Mineral matter - -	2·60

917. Gram, 1st sort. Nagpur.
948. Gram, 2nd sort. Nagpur.
949. Gram, 3rd sort. Nagpur.
950. Gram, White. Nagpur.
976. Gram, Dal. Nagpur.

8,799. Gram. Dacca.

3,562, 3,576, 3,618. Gram. Oude.

5,899, 5,938. Gram. Kattywar.
5,945, 5,964. Gram. Baroda.
5,985. Gram. Sattara.
6,040. Gram. Dharwar.
6,110. Gram. Surat.
6,124. Gram. Ahmednuggar.
6,160. Gram. Nassick.
6,186. Gram. Belgaum.
6,212. Gram. Tanna.

6,221–2. Gram. Mr. V. Fretwell. Khandeish.
6,275. Gram. Ahmednuggur.
6,302. Gram. Kutch.

381. Gram, White. Thawur Hindoo, Sindh.
3,348. Gram, Black. Amritsur.
3,349. Gram, White. Amritsur.

808. Gram. Berar.

3,719. Gram. H.H. the Maharajah of Benares.

864. Gram. Indore.

2,203. Gram. India Museum.

COMMON PEA.

Pisum arvense.

The common grey field pea is common in India. In the Deccan, Colonel Sykes states that it is sown in October by the hand and brought to perfection by the dews in January or February.

Peas are used precisely in the same manner as gram, with the exception of their not being given to horses, and not being made into Lashoo (a kind of Dál pudding). The haulm and remains of the pods are considered good fodder for cattle. The Mahrattas distinguish three kinds, the grey seeded, dark seeded, and white seeded. Although it is generally supposed that our common peas originated from a Mediterranean stock, the small grey Himalayan pea of Lawson's "Synopsis" is there cited as the probable origin, as follows:

"Its seeds were sent from the Himalaya under the name of Kullaoo, and being from a district of Asia which is supposed to have produced many others of our most useful cultivated plants, it is not improbable but that it may be the origin from which all the improved varieties of the pea at present in cultivation have been derived."

951. Peas. Nagpur.
975. Peas, Dal. Nagpur.
8,802. Peas. Howrah.
5,970. Peas. Baroda.
6,036. Peas. Dharwar.
6,081. Peas. Aden.
6,107. Peas. Aden.
(218.) Peas. Surat.
6,112. Peas. Surat.
6,156. Peas. Nassick.
6,218. Peas. Tanna.
6,226–7. Peas. Mr. V. Fretwell. Khandeish.
814. Peas. Berar.
846. Peas. Indore.
3,378. Peas. Kangra.
3,614, 3624. Peas. Oude.
2,253, 2,254. Peas. India Museum.

CHICKLING VETCH.

Lathyrus sativus.

This Chickling vetch is cultivated in various parts of India where it is used as food chiefly as Dál. It will be remembered that Duvernoy ascribed such pernicious qualities to this pulse, as causing rigidity of the limbs, delirium, and other dreadful effects to such an extent that the Duke of Wurtemberg, in 1671, prohibited its use by edict, which was confirmed by his successors. In the recent Pharmacopæia of India, attention was called to this plant in a special note, because "the continued use of its seeds as an "article of diet is apt, under certain circumstances "to induce paralysis of the lower extremities. In "one district in Bengal, nearly 4 per cent. of the "population were sufferers from it."

8,805. Kessaree. Howrah, Bengal.
812. Kessaree. Berar.
844. Kessaree. Indore,
3,619. Kessaree. Oude.
384. Kessaree. Syud Gool Mahomedshah of Schwan. Sind.
3,360. Kessaree. Amritsur.
2,222. Kessaree. India Museum.

LENTIL.

Ervum lens.

This pulse is widely, but not largely cultivated in India where it is eaten either boiled whole, or split and used as other split pulse are used. In Northern India it is also ground and mixed with flour. The legumes are eaten green as a vegetable.

In Southern India the return in cultivation is reckoned as 30 for one. Dr. Stewart believes that he has seen it growing as high as 5,500 feet on the Chenab and it is cultivated in parts of Ladak to 11,500 feet.

1,523. Lentils. Dr. G. Bidie. Madras.

Composition in 100 parts:—

Water - - -	11·74
Nitrogenous substances -	27·96
Fat - - - -	1·47
Starch - - -	56·36
Mineral matters - -	2·48

8,806. Lentil. Howrah.
6,030. Lentil. Dharwar.
6,084. Lentil. Aden.
6,161. Lentil. Nassick.
6,184. Lentil. Belgaum.
6,228–9. Lentil. Mr. V. Fretwell. Khandeish.
6,279. Lentil. Ahmednuggur.
851. Lentil, Dal. Indore.
3,353. Lentil. Amritsur.
3,354. Lentil, Split. Amritsur.
3,377. Lentil. Kangra.
3,409. Lentil. Kashmir.
3,611, 3,615, 3,639. Lentil. Oude.
970. Lentil. Nagpur.
2,214. Lentil. India Museum,

GROUND NUT.

Arachis hypogæa.

This common and universally distributed plant yields seeds which are largely expressed for oil. Subsidiary to this it is employed as food. In Bombay it is a favorite food with the Hindus during periods of fasting.

2,704. Ground nuts. India Museum, London.
1,508. Ground nuts. Dr. G. Bidie. Madras.
821. Ground nuts. Berar.
877. Ground rents. Indore.
6,264. Ground rent. Khandeish.

SWORD BEAN.

Canavalia gladiata.

It is the opinion of Sir Walter Eliot that this bean is only the cultivated form of *Canavalia vivosa*, the latter is found wild in almost every hedge in India, and the former is only known under cultivation. It is a perennial climber ascending to the summit of the loftiest trees, and bearing year after year from the end of the rains, through the cold season, an abundant crop. The seeds are large and of different colours; the white-seeded is most esteemed, but there is also a red-seeded and a brown seeded variety. The unripe pods are used as a vegetable, and the seeds as a pulse.

8,807. Sword Bean. Bengal.
7,260. Sword Bean. Khandeish.
2,201. Sword Bean. India Museum, London.

WALL OR NANKIN BEAN.

Lablab vulgare.

Of this there are numerous varieties and it is found both wild and cultivated; chiefly in the southern part of India. The pods are eaten green as a vegetable, the seeds are split for Dal and are eaten by the poorer classes, especially when rice is dear. The remains of the plant are used as a fodder for cattle. Dr. Ainslie remarks that this pulse "constitutes the chief part of the food of Lascars on "ship board; and the sepoys, in making long "marches, often carry it ready boiled in their knap-"sacks."

1,510–2. Wall. Dr. G. Bidie. Madras.
5,941. Wall. Kattyawar.
5,967. Wall. Baroda.
6,065. Wall. Dharwar.
6,109. Wall. Surat.
6,211. Wall. Tanna.
2,221. Wall. India Museum, London.

CHOWLIE.

Dolichos sinensis.

This is a very variable plant both in flower and seed, the latter being white, red, dun, brown, black, &c., and also varying very much in size. It is at any rate extensively cultivated and the seeds are used as Dal or ground up and mixed with other grains as flour. The green legumes are eaten as a vegetable.

1,518. Dolichos sinensis. Dr. G. Bidie. Madras.

5,900, 5,932. Dolichos sinensis. Kattywar.
5,971. Dolichos sinensis. Baroda.
6,041. Dolichos sinensis. Dharwar.
6,083. Dolichos sinensis. Aden.
(225.) Dolichos sinensis. Surat.
6,134. Dolichos sinensis. Ahmednugger.
6,140, 6,155. Dolichos sinensis. Nassick.

6,231–2. Dolichos sinensis. Mr. V. Fretwell. Khandeish.

6,294. Dolichos sinensis. Kutch.

386. Dolichos sinensis. Gangee Cutchee of Karachi.

865. Dolichos sinensis. Indore.

3,356, 3,358. Dolichos sinensis. Amritsur.

2,209. Dolichos sinensis. India Museum.

BURBUTTI.

Dolichos catjang.

This pulse is grown alike in fields and gardens, and is eaten dry or green. The young pods are esteemed as a vegetable, and the ripe seeds are split as Dal and used in soups and in other ways. As this is a strong climber it yields a considerable return, flowers and legumes being produced successively as the plant continues to grow. It is difficult to make accurate, or even approximate estimates of the relative cultivation of these plants, but it seems to be true that this is not so much cultivated for its pulse as the allied species *Dolichos sinensis*. Whether botanically they are really distinct species, as some doubt, is not important economically, only that the two are so often confounded, and the names applied interchangeably to the seeds in collections sent to Europe, that it is difficult to ascertain localities for each form separately. It is the *Pee-yan* of Pegu.

1,517. Burbutti. Dr. G. Bidie. Madras.

3,590. Burbutti. Oude.

2,206. Burbutti. India Museum, London.

HORSE GRAM.

Dolichos uniflorus.

The flat, almost lenticular seeds of this gram are so peculiar that they are easily recognised. The plant is extensively cultivated in Southern India, where it is known as Horse gram, from its forming the staple food of horses and cattle. The poorer classes also employ it as a Dal in their soups, &c. It is rather a free producer, Colonel Sykes having in the Deccan counted 309 seeds from a moderate-sized plant. Roxburgh observes that "in a good "soil and favourable year the produce will be sixty-"fold." In the Himalaya Dr. Stewart notes that it is commonly cultivated for its pulse up to 7,000 feet or more. It is a very useful plant since it will grow in a very meagre soil.

1,515–6. Horse gram. Dr. G. Bidie. Madras.
Used for feeding horses in the south of India.

Composition in 100 parts :—

Water - - -	12·03
Nitrogenous substances -	23·27
Fat - - - -	2·20
Starch - - -	59·38
Mineral matters - -	3·19

961. Horse gram. Nagpur.

6,263. Horse gram. Mr. V. Fretwell. Khandeish.
6,291. Horse gram. Kolkapoor.
5,913. Horse gram. Kattyawar.

858. Horse gram. Indore.

3,355. Horse gram. Amritsur.
3,383. Horse gram. Kangra.

3,413. Horse gram. Kashmir.

6,060. Horse gram. Dharwar.
6,117. Horse gram. Ahmednuggar.
6,153, 6,163, 6,148. Horse gram. Nassick.
6,177. Horse gram. Belgaum.
2,211. Horse gram. India Museum.

GOWAR.

Cyamopsis psoralioides.

This pulse is not much cultivated in fields, but is common as a garden vegetable in many parts of India. The green pods are employed as a vegetable in the same manner as "French beans." The seeds are relished by cattle, but do not enter largely into human food. The plant produces its legumes abundantly in succession as it grows, and is so cultivated that the green pods can be obtained all the year round. In the Punjab, Dr. Stewart states that it is occasionally cultivated as a hot weather crop for its pulse, west to the Ravi at least. The Rohtak Local Committee communicated to the Punjab Exhibition of 1864 the information that the pulse is there "made into Dal, to be used principally for "cattle; it is boiled in a pan, and then the grains "are rubbed and worked about with the hand till a "froth rises on the mass; a little mustard seed oil "is then added; it is given to cattle to fatten "them."

5,930. Gowar. Kattyawar.
5,960. Gowar. Baroda.
(226.) Gowar. Surat.

387. Gowar. Gangjee Cutchee of Karachi.

2,205. Gowar. India Museum, London.

SOY BEAN.

Soja hispida.

The "Soy Bean," called also "Japan Pea," is of two kinds, one yellow, the other green. As will be seen below, both varieties are very identical in composition.

The nutritive power of the "Soy Bean" is superior to any vegetable food substance yet discovered. It grows in the Himalayas, but appears to be chiefly cultivated in the north of China, and particularly in the province of Shantung. It is calculated that upwards of 3,000 junks are employed in its export to southern parts of the country. It is compressed for its oil, and the cake then used for feeding men and animals; it is also extensively employed for manure.

This bean is by far too rich for employment as a food *alone*, and should therefore be mixed with substances poor in "muscle-giving" constituents, in order that the one may be brought up and the other down to the nutritive standard of wheat. Properly employed in this way, the "Soy Bean" is likely to prove of great value.

The plant itself has the character of a shrub. It branches near the ground, and attains a height of from three to nearly four feet. The stalks are too woody for fodder in the dried state.

COMPOSITION.

Yellow variety.	Per cent. on Moist.	Per lb. on Moist.
		ozs. grs.
Moisture	12·000	1 403
Nitrogenous matter*	36·089	5 340
Fatty matter	18·075	2 392
Starch, &c.	29·762	4 337
Potash	1·716	119
Soda	0·068	5
Sesquioxide of iron	0·039	3
Lime	0·218	15
Magnesia	0·354	25
Phosphoric acid	1·061	74
Sulphuric acid	0·241	17
Chlorine	Trace	—
Sand, &c.	0·150	11
	99·773	16 000 —9
Nitrogen in nitrogenous matter	5·73	401 grs.
Sulphur in ditto	0·137	10 grs.

COMPOSITION.

Green variety.	Per cent. on Moist.	Per lb. on Moist.
		ozs. grs.
Moisture	12·000	1 403
Nitrogenous matter*	38·919	6 98
Fatty matter	16·966	2 315
Starch, &c.	28·215	4 224
Potash	1·731	121
Soda	0·026	2
Sesquioxide of iron	0·034	3
Lime	0·237	17
Magnesia	0·355	25
Phosphoric acid	1·162	81
Sulphuric acid	0·240	17
Chlorine	Trace	—
Sand, &c.	0·114	7
	99·999	16 000
*Nitrogen in nitrogenous matter	6·180	434 grs.
Sulphur in ditto	0·191	14 grs.

2,257. Soy Bean. India Museum, London.

HORSE BEAN.

Faba vulgaris.

The common field bean or horse bean of Britain is rare in India, but it seems to have been cultivated in a few localities, especially in the north of India, although not of much repute. Its Hindustani name is *Bakla*, and in the Punjab it is known as *Chastang*, modified in Ladak to *Nakshan*.

3,408. Horse Bean. Kashmire.

MUTT.

Phaseolus aconitifolius.

The plant is low and herbaceous, the leaves are so deeply cut as to be almost palmate. It is seldom sown alone, and ripens in November-December. Split, it forms one of the Dals, and ground into flour is used for bread and cakes by the natives, and sometimes is used mixed with wheat flour. The steeped grain is also given to cattle. The plant after the seeds are removed is used as fodder. Two varieties are cultivated, the white and black, in the higher provinces of India. It is commonly cultivated as a hot-weather crop all over the Punjab plains, but chiefly in the arid parts with light soil.

385. Mutt. Thawur Hindoo of Boobuc. Sind.

813. Mutt. Berar.

3,352. Mutt. Amritsur.

3,412. Mutt. Kashmir.

3,620. Mutt. Oude.

971. Mutt. Mote dall. Nagpur.

5,965. Mutt. Baroda.

2,240. Mutt. India Museum, London.

3,612. Phaseolus sp. (Bhutwan). Oude.

GREEN GRAM.

Phaseolus Roxburghii.

According to Walter Elliot, "this is perhaps the "most esteemed of all the pulses, though not the "most extensively grown. It bears a higher price, "and is more in request among the better classes, "entering largely into many of the more delicate "dishes, and cakes, such as the *paparam* or relish "cakes, and those baked for religious ceremonies. "Mixed with grain it is considered to be strengthen-"ing for horses; the straw makes good fodder for "cattle."

There are several varieties distinguished by the size and colour of the seeds, and the plant has a wide distribution in India. The grain is split for Dal, or ground into meal. In the hills it is cultivated up to 6,500 feet. There has been, and still is, considerable confusion of this species with *Phaseolus mungo*, and *P. max.* so that it is difficult to determine in many cases which is really intended, and the native names alike seem to partake of this uncertainty, and therefore give very little help towards the determination of species in the absence of specimens.

1,519. Green gram. Dr. G. Bidie. Madras.

3,566, 3,606, 3,568. Green gram. Oude.

8,808, 8,818. Green gram. Rajshahje.

7,831. Green gram.

8,804. Green gram. Howrah.

7,898. Green gram.

8,801. Green gram.

5,934–5. Green gram. Kattyawar.

5,947, 5,961. Green gram. Baroda.

6,033, 6,037?, 6,038. Green gram. Dharwar.

6,079. Green gram. Aden.

6,111, 6,113. Green gram. Surat.

6,149, 6,154, 6,157, 6,173. Green gram. Nassick.

6,179. Green gram Belgaum.

6,208, 6,213. Green gram. Tanna.

6,259–62. Green gram. Mr. V. Fretwell. Khandeish.

6,280, 6,282. Green gram. Ahmednugger.

6,292. Green gram. Kolkapoor. Ahmednugger.

6,298. Green gram. Kutch.

5,901–3. Green Gram. Kattyawar.

383. Green Gram. Sindh.

810. Green Gram. Berar.
863. Green Gram. Indore.
849. Green Gram. Indore.

3,348. Green Gram. Amritsur.
3,384. Green Gram. Kangra.

3,715–7, 3,720. Green Gram. H.H. the Maharajah of Benares.

962, 968, 974. Green Gram. Nagpoor.
2,249. Green Gram. India Museum, London.

PHASEOLUS MUNGO.

"Moog is sown," says Colonel Sykes, "with the first fall of rain in fields by itself; in favourable seasons it attains the height of two feet. It succeeds very well in a stony soil, and is frequently sown on lands at the base of the low hills, and on the table land above, where the soil is not to be seen from the multitude of stones on the surface. In a small field, planted near a well, and occasionally watered, I counted 62 legumes on one plant with from 7 to 14 seeds in each. The average of 10 seeds to a legume would give a return of 620 for one. The remains of the plant and legumes, when the seeds are beaten out, make excellent fodder for cattle. The grain is eaten in various ways. It is boiled whole, and eaten with salt and pepper. It is split, and becomes one of the Dals. It is parched, ground into flour, and made into balls with sugar and spices, and in this way forms food for travelling. In times of scarcity a bread is made from it. It is also used in porridge or soup. The unripe legumes are eaten as a vegetable.

It is one of the most extensively cultivated of Indian pulse, up to 3,500 feet on the hills, and it is considered nutritious and digestible.

963. Phaseolus mungo. Nagpur.

972. Phaseolus mungo. Nagpur.

3,410, 3,411. Phaseolus mungo. Kashmir.

1,522. Phaseolus mungo. Madras. G. Bidie.

3,597. Phaseolus mungo. Oude.
3,575. Phaseolus mungo. Oude.
3,603. Phaseolus mungo. Oude.
3,569. Phaseolus mungo. Oude.
3,609. Phaseolus mungo. Oude.

7,907. Phaseolus mungo. Maunbhoom.
7,825. Dal. Maunbhoom.
5,914, 5,933, 5,936. Phaseolus mungo. Kattyawar.
5,958. Phaseolus mungo. Baroda.
6,034, 6,035. Phaseolus mungo. Dharwar.
6,114. Phaseolus mungo. Surat.
6,133. Phaseolus mungo. Ahmednugger.
6,139, 6,159. Phaseolus mungo. Nassick.
6,189. Phaseolus mungo. Belgaum.
6,209. Phaseolus mungo. Tanna.
6,257, 6,258. Phaseolus mungo. Khandeish.
6,297. Phaseolus mungo. Kutch.

382. Phaseolus mungo. Sindh.

803. Phaseolus mungo. Berar.

3,351. Phaseolus mungo. Amritsur.

7,825. Moong Dal. Chittagong.

It is uncertain to which species of *Phaseolus* the following should be referred.

6,064. Karalay. Dharwar.
6,129. Ahmednugger.
6,214. Tanna.

KIDNEY BEAN.

Phaseolus vulgaris.

This, the common kidney bean, is cultivated in many parts of India, but not so extensively as some other species, although it is supposed to have been originally a native of this, or of a neighbouring country.

3,357. Kidney beans. Amritsur.
3,414. Kidney beans. Kashmir.

B.—COFFEE.

The coffee berry is being extensively cultivated in the highlands of southern India, and large tracts of country are available for the extension of its growth.

The subjoined remarks on coffee-planting in Mysore are by Colonel Onslow:—

According to the traditions of the country, the coffee plant was introduced in Mysore by a Mussulman pilgrim, named Baba Booden, who came from Arabia about 200 years ago, and took up his abode as a hermit in the uninhabited hills in the Nuggur Division named after him, and where he established a muth or college, which still exists, endowed by Government. It is said that he brought seven coffee berries from Mocha, which he planted near to his hermitage, about which there are now to be seen some very old coffee trees. However this may be, there is no doubt that the coffee plant has been known in that neighbourhood from time immemorial; but the berry has never come into general use among the people for a beverage. It is only of late years that the coffee trade of these districts has become of any magnitude, or that planting has been carried to any important extent. There is no record of either farther back than the year 1822, when the revenue was under contract. In the year 1837, when the country had been some years under British rule, the Raja's authority having been suspended in 1832–3, the contract system was discontinued, and a duty of one rupee per maund of 28 lbs. was fixed. From that time the production of coffee and duty is duly recorded. In 1843 the duty was reduced to half a rupee per maund on exportation, and in 1849 to a quarter of a rupee. Together with the reduction of duties, regulations for taking up and holding coffee lands were adopted. At the same time prices continued to rise. Native coffee sold in the country has risen from 1 rupee per maund of 28 lbs. to 6 and 8 rupees.

The encouragement thus given to coffee planters has resulted in the great extension of planting, the prosperity of the planters, and an increase of revenue to the state.

Under the contract system the revenue averaged from 1822 to 1832, 4,270 rupees annually, and from 1832 to 1837, 7,472 rupees annually. The yearly average during the next six years under the duty

system, the duty being 1 rupee per maund, was 15,238 rupees on that number of maunds. During the next six years, the duty being half a rupee per maund, the average yearly produce rose to 52,236 maunds, giving a revenue of 26,118 rupees yearly. During the next 12 years, that is, up to 1861 inclusive, to which time the accounts are made up, the yearly average of produce rose to 346,083 maunds, and the revenue to 86,524 rupees, the duty having been reduced to a quarter of a rupee per maund. This short statement serves to show the good effect of liberal measures.

More than 30 years ago a few Europeans were engaged in coffee planting near Chickmoogloor, a few miles from the Bababooden Hills. "Bad mountain" were commenced by two enterprising gentlemen. The success of these has induced many more Europeans to plant coffee in Mysore. The consequence is, that the coffee trade of Mysore bids fair to emulate that of Ceylon. It has given also an example to other parts of India, and the plant originally taken from the Bababooden Muth is now extending over tens of thousands of acres in Coorg, the Wynaad district, the Neilgherry Hills, and along the Western Ghauts, North and South.

In Mysore the number of European coffee planters has within the last 10 years increased to 20 or 30. The number of native planters is estimated between 3,000 and 4,000. The quantity of land planted or taken up cannot be ascertained with any degree of accuracy. The revenue depending upon the quality of the coffee produced, not upon a tax on land, there is no regular correct system of land measurement. This way of taxing is bad; it leads to bad cultivation and smuggling. It is to be hoped that a land tax will be adopted instead, which would have a good moral and fiscal effect. It would put an end to smuggling, and would be a great inducement to the natives to improve their cultivation, which is now very slovenly. If the tax were on the land they would make more effort to increase the produce of it. The average produce per acre in Mysore is probably not half that of Ceylon.

The coffee districts are confined to the region of the Western Ghauts and the Bababooden Hills. Some attempts have been made to cultivate coffee in the open country, but without success; it seems to require forest land and considerable elevation and moisture.

Elevations of 3,000 feet and under that to 1,200 are probably the best for coffee. Plantations at higher elevations than these may occasionally come into use to secure high-flavoured produce without reference to profit. The whole of the coffee district, with here and there an exception of feverish spots, possesses a climate in which the European can live and work with comfort, and, with moderate care and prudence, with health. The presence of the Borer insect, which of late has proved so destructive to the coffee plantations, has been attributed by the Natives to *over-clearing* and cultivation. This explanation seems more probable from the fact that the more roughly cleared and less cared for gardens of the natives are seldom subject to the attacks of these insects, and as it is certain that they do not attack the younger and more sappy wood, the native idea of leaving a few forest trees and stumps for them to feed upon is not so far-fetched a notion as we, in our supposed greater wisdom, may happen to think.

Planting has of late years been carried to such an extent by Europeans and natives in Mysore, that but little available land remains. These mountain and forest wastes have been turned into rich productive gardens. From being the most wild and desolate parts of Mysore, these districts have become very prosperous, and the people have been raised from poverty to comfort, and in many instances to wealth. The natives are benefiting largely by the capital and example of European planters, and are learning the science of planting.

Mysore generally, especially the coffee districts, affords a most promising field for European capital and enterprise.

1,528–9. Coffee. Dr. G. Bidie. Madras.
2,191. Salem Coffee.
2,184–5. Pollay Betta Coffee. Coorg.
2,186–7. Craig Tilly Coffee. Coorg.
2,188. Anderson's Coffee. Mysore.
2,189. Coffee. Mysore Coffee Company.
2,190. Coffee. Cullaly Estate, Mysore.
P.B. Pea Berry Coffee. Captain R. N. Taylor. Coorg.
A. and B. Plantation Coffee. Captain R. N. Taylor. Coorg.

Grown on the Jaggoonda Estate, in the province of Coorg. Elevation, 3,000 feet. Average Temperature, about 750 Fahr. Fall of rain under 100 inches. Exhibited by the proprietor.

6,097 to 6,106. Collection of Arabian Coffee from Aden, exhibited by Bombay Local Committee.
8,482. Coffee grown in Chittagong. W. Sarson.

C.—SPICES.

Spices are very extensively employed in the cooking operations of Oriental nations, including many which are scarcely known in that character in the West. This is the case especially with the carminative seeds, such as coriander, carraway, &c., which we are not accustomed to see in company with mustard and pepper, but are associated with them in the Asiatic *cuisine*.

GINGER

Zingiber officinale

Is the dried rhizome or underground stem of a plant which is cultivated for that purpose in the tropical regions of both hemispheres. Its quality and commercial value differs considerably in different localities, and is influenced very much by the method of collection and preparation.

871. Ginger. Indore.
3,587. Ginger. Oude.
8,828. Ginger. Rajshahye.
2,637. Ginger. India Museum, London.

The following account of the cultivation of ginger has been received from the Hill States adjoining the Ambàlah district. Ginger is principally produced in Mahúr Mássá, Patrá, Dárrá, Kothi, Kotahi, Bágal, and Jayál. The best pieces of last year's harvest are selected and placed in the corner of a house in the month Phágan; the heap is then

smeared over and covered with cowdung to keep the roots from drying up in Hár month, when the first rain falls, they plough up the land two or three times; they divide the land off into beds with a little raised edge round each bed, taking care to make openings to let superfluous water run off, for if water stands on the crop, the roots will rot. They then bury little pieces of the roots three inches deep in the soil at intervals of nine inches; they next cover over the field with the leaves of trees, which keeps the soil moist, and over the leaves they spread manure, to a depth of half an inch; when it rains the water impregnated with manure filters readily through the leaves to the roots. Artificial irrigation is not employed while the rain lasts, but from Assuh to Poh it is necessary. In the month Poh the plants are about two feet high, for every one shoot there are eight tubers or parts of the root; these are dug out and buried in another place for a month; then they are taken out, exposed to the sun for a day, and are then fit for use.

In the months of Sawán, Bhadon, and Assúh, three times, the field is weeded. A begah of land requires eight maunds of ginger to plant it, and yields 32 maunds for a first-rate crop.

Ginger fit for planting again sells at eight to ten seers per rupee; that for use only, at 24 to 32 seers per rupee.

In order to dry ginger into "sonth," the fresh roots are put into a basket which is suspended by a rope, and then two men, one on each side, pull it to and fro between them by a bit of rope attached, and thus shake the roots in the basket; this process is carried on for two hours every day for three days. After this, the roots are dried in the sun for eight days, and again shaken in the basket. The object of the shaking together is to take off the outer scales and skin of the roots. A two days' further drying completes the process, and sonth sells three seers to four seers per rupee.

Turmeric is cultivated in the same manner; when ready it is dug up, steeped in hot water a day and a night, and then dried.

TURMERIC

Curcuma longa

Is also the dried rhizome of a similar plant to ginger, which likewise is widely cultivated. The bright yellow powder of these rhizomes forms one of the chief ingredients of the renowned "curry powder" which has such an important place in Indian cookery.

822. Turmeric. Berar.
3,610. Turmeric. Oude.
874. Turmeric. Indore.
7,291. Turmeric. Nasick, Bombay.
8,831. Turmeric. Rajshahye.
2,575. Turmeric. India Museum, London.

GARLIC.

Allium sativum.

The fresh and dried bulbs are included with spices under this section their function being similar, in imparting their characteristic flavour to dishes in which they form an ingredient. In India, to some extent, *Asafœtida* supplies the place of garlic, although it by no means supersedes it.

823. Garlic. Berar.
2,539. Garlic. India Museum, London.

ONION.

Allium cepa.

Dried onions, equally with Garlic, seem entitled to a place here rather than with vegetables, although neither of them are literally spices.

824. Onions. Berar.

PEPPER.

Piper nigrum.

Consists of the dried berries of a climbing plant, which is indigenous to the forests of Malabar and Travancore. The pepper vine is propagated from cuttings or suckers, laid down at the commencement of the monsoon, in a rich and tolerably moist soil. In three years it begins to bear, each plant yielding on an average 1½ lbs. of pepper per annum. The crop is gathered in March and April. The fruit is plucked when not quite ripe, and dried on mats in the sun. White pepper differs from black only in being deprived of the outer skin by a short maceration in pure water, and subsequent gentle rubbing. In North Canara it is most successfully grown *above* the ghauts, although it succeeds well below. An acre of land will bear 2,500 plants, and as they require little care, the cost of cultivating and bringing into bearing one acre does not exceed 40 rupees at the most, and as the annual yield when the plants come into bearing is worth upwards of 800 rupees, the investment is a very profitable one.*

7,284. Black pepper. Nasick, Bombay.
119. Black pepper. Bangalore.
2,611. Black pepper. India Museum, London.
2,223. Wild pepper. Madras.
2,224. White pepper. Madras.
2,225. Lunkah pepper. Madras.
2,226. Indian pepper. Madras.

MUSTARD.

Sinapis sp.

The seeds of several species or varieties of *Sinapis* are employed in India. It is scarcely possible to determine the species or varieties from the seeds themselves, hence they are grouped together under the above general heading. Probably a large proportion may be referred to *Sinapis juncea*. Oil is also expressed from these seeds to a considerable extent, and they appear again under the heading of Materia medica.

818. Sinapis ramosa. Berar.
3,593. Sinapis glauca. Oude.
3,579. Sinapis nigra. Oude.
7,294. Mustard. Nasick, Bombay.
8,824. Mustard. Rajshahye.
8,826. White mustard. Dacca.
6,271. Mustard. Khandeish.
6,136. Mustard. Ahmednugger.
6,088, 6,089, 6,092. Mustard. Aden.
6,062. Mustard. Dharwar.
850. Mustard. Indore.

* *Times* of India, 11th October 1862.

3,430. Mustard. Kangra.
3,437. Mustard, White. Amritsar.
3,438. Mustard, Black. Amritsar.
978. Mustard. Nagpur.
5,909. Mustard. Kattyawar.
5,953, 5,977. Mustard. Baroda.

CHILLIES.

Capsicum sp.

Here again a large number of species, probably chiefly *Capsicum fastigiatum* and *Capsicum frutescens* appear under the name of chillies or red pepper. The dried ripe fruit is the part used, and some one or more of the numerous species of *Capsicum* yielding them are cultivated all over India. When powdered, they constitute chilly powder, or cayenne pepper.

7,295. Dried chillies. Bombay.
825. Dried chillies. Berar.
905. Dried chillies. Indore.
8,834. Dried chillies. Dacca.
8,829. Dried chillies. Rajshahye.
292. Nepal chillies. Karachi.
2,215. Bird's-eye chilly. Madras.
2,216. Cayenne chillies. Madras.
2,222. Cayenne pepper. Madras.

CLOVES.

Caryophyllus aromaticus.

The unexpanded flower-buds of the clove tree constitute the "cloves" of commerce. The largest proportion of this spice which is consumed in India is derived from Penang, where the tree has been introduced, and some probably reach Bombay from Zanzibar.

7,293. Cloves. Bombay.
2,559. Penang cloves. India Museum, London.

CORIANDER.

Coriandrum sativum.

The Coriander plant is cultivated extensively in India for the sake of its seeds, which enter into the composition of curry-powder, and are employed in other ways as a spice or condiment, and as a medicine. The green plant is also used as a vegetable, and is exposed for sale in the bazaars during most part of the year.

815. Coriander. Berar.
906. Coriander. Indore.
3,581. Coriander. Oude.
7,287. Coriander. Nasick, Bombay.
8,830. Coriander. Rajshahye.
5,956. Coriander. Baroda.
6,046. Coriander. Dharwar.
6,288. Coriander. Kolkapoor.
2,572. Coriander. India Museum, London.

CARRAWAY.

Carum carui and *Carum gracile.*

Two kinds of carraways are met with in India, that of the North being almost exclusively *Carum gracile* or black carraways, from their darker colour. There is sufficient difference in the fruits, when seen under a low power of the microscope, to warrant the conclusion that the two species are distinct. The common carraway is also grown in India, reaching as far as Cashmere and Western Tibet.

816. Carraways. Berar.
907. Carraways. Indore.
3,601. Carraways, Black. Oude.
8,835. Carraways. Dacca.

CUMIN.

Cuminum cyminum.

Cumin seeds are met with in the bazaars all over India, where they are in much use as a condiment. The plant is said to grow wild in the hills north of the Peshawur Valley and in Lahoul.

7,286. Cumin. Bombay.
5,984. Cumin. Sattara.

ANISE.

Pimpinella anisum.

This is an European plant, but it is cultivated in some parts of India, where it is employed whilst green as a pot herb, and also for the sake of its seeds. These latter are employed medicinally, at well as for a condiment.

8,832. Anise. Rajshahye.

FENNEL.

Fœniculam panmorium.

The fennel seed found in the Indian Bazaars is the produce of this species, which is regarded by some as only a variety of *Fœniculum vulgare.* Its uses and properties are similar to those of the other umbelliferous seeds, such as Carraway, &c.

3,580. Fennel seed. Oude.

AJWAN.

Ptychotis ajowan.

These little aromatic seeds are employed by the natives for medicinal and culinary purposes. They may be purchased in any bazaar in India, and are one of the most common of carminative seeds.

819. Ajwan. Berar.
3,577. Ajwan. Oude.
8,833. Ajwan. Dacca.

AJMUD.

Ptychotis Roxburghiana.

This plant, which produces this carminative seed, is the *Apium involucratum* of Roxburgh. It is the smallest of the umbelliferous seeds in use in India, resembling *Ajowan,* but not so aromatic in odour or flavour, and probably inferior.

8,838. Ajmud. Dacca.

CARDAMOMS.

Elettaria cardamomum.

The Officinal, or Malabar Cardamoms are well known in Europe for their medicinal uses, but in India they are equally appreciated and used as a spice or flavouring ingredient, entering into the composition of many native dishes. The plant is a native of the Western Coast, and is cultivated in Malabar. In the Travancore forests it is found at elevations of 3,000 to 5,000 feet. The mode employed for obtaining cardamoms is to clear the

forests of trees, when the plants spontaneously grow up in the cleared ground.

7,298. Cardamoms. Nasick, Bombay.

A. & B. Cardamoms. Capt. R. N. Taylor, Coorg. Grown on the Tounand Estate, situated on the Western mountains of India in the British province of Coorg. Elevation from 2,000 to 3,000 feet above the sea. Climate mild, but very wet for six months, from May to October. Fall of rain about 150 inches annually.

EDIBLE CRYPTOGAMS.

Provision was hardly made in the Vienna classification for the recognition of the various Edible Fungi and sea-weeds, from different parts of the world. These are chiefly accessory and not staple articles of food, and as such would better perhaps occupy some place near spices and condiments, since the uses of Fungi as food are more commonly for imparting a flavour to dishes than of independent use.

ALGÆ OR SEAWEEDS

are represented by the two best known and most highly appreciated examples.

2,304. Agar-Agar (*Euchenma spinosum*). India Museum, London.

2,305. Ceylon moss (*Gracilaria lichenoides*). India Museum, London.

EDIBLE FUNGI

are only represented by three species.

2,302. Dried mushrooms (*Agaricus fossulatus*). From Singapore. India Museum, London.

2,302*a*. Dried mushrooms (*Agaricus subocreatus*). From Cabul. India Museum, London.

2,306. Jew's ear (*Hirneola Auricula-Judae*). India Museum, London.

The latter is a great favourite with the Chinese, and is imported from Tahiti and other places, in large quantities into Singapore.

D.—NARCOTICS.

Under this sub-section the Indian Exhibits consist of Tobacco, Hemp, Betel-nut, and Pan. Tobacco manufactures and Opium belonging to Group IV.

TOBACCO.

Nicotiana tabacum, &c.

Tobacco is cultivated, more or less, in nearly every village. Major Clarke states that it is cultivated either on the "gœra" lands, or preferentially on some highly enriched plots of ground, such as are commonly found around villages. The seed is sown in the month Kattak, under the shade of the Bei or sisoo tree, facing to the south, that it may have sun during the day, and yet be protected from night chills; as soon as it is sown it is covered with ashes; if a tree cannot be had, it is protected or sheltered from the north wind by any screen; the young plants are transplanted out in Mágh or Phágan; sometimes a part of the land ploughed for wheat is reserved for tobacco, or if not, the land is ploughed in Poh or Mágh, four or five times running, manuring it twice afterwards. The land cannot be too highly manured for this crop, which also requires three hand-hoeings and weedings; when blossoms appear they are all topped off to strengthen the plant; of course seed plants are excepted. After the plants are well above ground and have become strong the crumbling alkaline earth generally found at the foot of old walls in ruinous buildings, is applied to the root of each plant, with a view to improve the quality of the produce.

"The crop ripens in Jeth or Har, according as the sowings may have been in Mágh or Phágan; it is watered fifteen times; before cutting the crop it is essential to irrigate, for if cut when dry at the root the produce will be worthless. The tobacco is left on the spot where it grew for one day after it is cut; on the second day the leaves are all turned, and they are collected and kept covered in some secure place, whence they are taken out on the fifth day; the leafy part is then separated from the stalks and coarse fibres, and twisted into hanks or rolls of from one to two seers. The cultivation of tobacco is rather troublesome; it brings a return of twelve maunds per acre. The labour for separating the stalks, &c., from the leafy part is paid for by two twists of the tobacco for each person per diem."

7,641. Tobacco. Broach.
7,642. Tobacco. Gujerat.
7,643. Tobacco. Kolapoor.
7,646. Tobacco. Neriad, Surat.
7,647. Tobacco. Soomao, Surat.
7,648. Tobacco. Boresad, Surat.
7,652. Tobacco. Kutch.
7,654. Tobacco. Gurakoo, Kutch.
7,653. Tobacco. Hoogly.
7,655. Tobacco. Kathawar.

7,644. Tobacco. The Chief of Meeruj.
7,645. Tobacco. H.H. the Guickowar of Baroda.

7,649, 7,650. Tobacco. Amund, Talooka Kaira. Mr. G. F. Shephard.

7,656. Tobacco. Kaira. Mr. G. F. Shephard.

7,651. Tobacco. Sholapoor. The Collector of Sholapoor.

410. Tobacco. Lake Munchur, Sind.
411. Tobacco. Thawur Hindoo of Boobuc.
412. Tobacco. Ramzan of Shadadpoor.
413. Tobacco from Shiraz seed, Bhagwandass Malhi, Shikarpoor.
414, 415. Tobacco. Thawurdass Hindoo of Boobuc.
416. Tobacco. Moolo Wuriram of Tatta.
417. Tobacco from Moostungi seed. Mooto Bunya Shiparpoor.
418. Tobacco, common. Mooto Bunya Shiparpoor.
419. Tobacco. Rutto of Halla, Haidarabad.

829. Tobacco. Berar.

1,600. Manilla tobacco grown in Travancore. H.H. the first Prince of Travancore.

1,601. Lunka tobacco. Madras. Roberts and Co.

879. Tobacco. Indore.

3,631. Dasee tobacco. Oude.
3,632. Poorkee tobacco. Oude.
3,633. Baraichee tobacco. Oude.

988. Tobacco. Wardha. Nagpur.
989. Tobacco. Hingunghat. Nagpur.

116. Tobacco. Bangalore.

GUNJA or BANG.

Cannabis sativa.

The dried leaves of the hemp plant are called "Bhang," and the flower tops with their resin, "Ganjah." The dried leaves are sometimes smoked alone or mixed with tobacco, but the more common form of taking bhang is to make it up with flour into a cake or a sweetmeat called "Majun." Eating this sweetmeat produces great excitement and mania in persons unaccustomed to their use.

828. Ganjah. Berar.
1,530-1. Ganjah. Dr. G. Bidie. Madras.
3,929. Bhang. Oude.
3,583. Ganjah. Oude.
987. Ganjah. Nagpur.

420. Bhang. Boobuc, Sind.
7,915. Ganjah. Calcutta.
7,917. Bhang. Calcutta.

CHURRUS

Is a gummy exudation from the flower heads of the hemp, and also from the seed when ripe. When the seed is gathered, the heads are rubbed with the hands, and thus the churrus is collected. In other places, men clothed with leather garments walk about among the hemp plants, brushing up against them. The gum resin adheres to the leathers, which are then taken off and carefully scraped.

3,513. Churrus. Amritsur.
3,617. Churrus. Oude.
7,916. Churrus. Calcutta.

ARECA or BETEL NUT.

Areca catechu.

The nuts of the Areca palm form the principal ingredient in the famous Oriental masticatory. These are gathered between August and November, removed from the husks in which they grow, and are then boiled till soft, are taken out, sliced, and dried in the sun.

117. Areca nuts. Bangalore.

1,526-7. Areca nuts. Dr. G. Bidie. Madras.

6,072. Areca nuts. Dharwar.

PAN.

Chavica betel.

The betel vine is cultivated for the sake of its leaves, which are employed, combined with Areca nut and chunam, or shell lime, as a masticatory. The leaf and nut when chewed discolour the teeth much, imparting to them a red colour; but natives assert that the gums become strengthened, and the teeth fixed by its use; the flavour is strongly astringent and pungent.

991. Betel leaves. Nagpur.

E.—OIL-SEEDS.

Some of the sources of oil in India are undoubted forest products; whilst others, and perhaps the majority, or the most important, are agricultural. It has not been attempted to separate them, as the International Jury recognised all together under this section.

LINSEED.

Linum usitatissimum.

Large quantities of linseed are imported into Britain from India. The oil is obtained either by simple expression without the aid of heat, when it is of a pale yellow colour, or by the application of a temperature of not less than 200° Fahr. In the latter case it is of a deep yellow or brownish colour and disagreeable odour. The oil prepared in India is inferior to that of Europe, from the fact that the Indian seeds being mixed with those of mustard, with which they are grown, the dying properties of the oil are impaired. Linseed contains one-fifth of its weight of mucilage (entirely resident in the testa) and one-sixth of its weight of fixed oil.

8,824*a*. Linseed. Rajshahye.
860. Linseed. Indore.
3,435. Linseed. Punjab.
3,426. Linseed. Kangra.
3,571, 3,589. Linseed. Oude.
6,273. Linseed. Khandeish.
981, 982. Linseed. Nagpur.
6,061. Linseed. Dharwar.
2,761. Linseed. India Museum, London.

MUSTARD.

Sinapis sp.

Several species, or at least distinct varieties, of *Sinapis* are cultivated throughout India for the sake of their oil, which is much esteemed for cookery, for medicine, and for anointing the person.

6,271. Mustard. Khandeish.
6,136. Mustard. Ahmednugger.
3,579. Sinapis nigra. Oude.
3,593. Sinapis glauca. Oude.
6,088, 6,089, 6,092. Mustard. Aden.
6,062. Mustard. Dharwar.
850. Sinapis glauca. Indore.
818. Sinapis ramosa. Berar.
396. Sinapis ramosa. Syud Gool Mahomed, Shah of Schwan.
3,430. Surson. Kangra.
3,437. White mustard. Amritsur.
3,438. Black mustard. Amritsur.
978. Mustard. Nagpur.
5,909. Mustard. Kattyawar.
3,953. Mustard. Baroda.
5,977. Mustard. Baroda.
2,791. Sinapis dichotoma. India Museum, London.

Allied to the foregoing are the following :—
3,416. Turnip seed. Kashmere.

3,429. Rape seed. Kangra.
397. Radish seed (*Raphanus sativas*). Chaloo Hindoo of Boobuc, Sind.

CASTOR OIL SEED.

Ricinus communis.

The castor-oil plant is extensively cultivated all over India. It is sown in June by almost all the villages, not extensively, but principally for their own use. Its cultivation can be extended all over Oude. The oil is extracted by bruising the seed and then boiling it in water; the oil is afterwards skimmed off. This is the only seed out of which the oil is extracted by boiling, as in this case it is found cheaper than the method used for other seeds, which is by pressure.

The cost of the seed is one rupee per maund, and the price of the oil is from 2 to 5 seers per rupee, according to the abundance of the crop in the season. The proportion of the oil yielded is about half the weight of the seeds boiled; it is only used for burning.

In Cuttack, the plant is grown all over the province, a good deal in patches of newly cleared land in the jungles of the Tributary States and Sumbulpore. The oil is extracted in two ways. It is used for burning and culinary purposes, and medicinally also. The local market is now 11½ peculs of the seeds per rupee. Both the native methods of extracting oil are wasteful and tedious, and therefore expensive. European oil presses and a knowledge of some methods of clarifying the expressed oil seem only to be required to render the oil seed crops of this extensive division of great value.

The large seeds, *Ricinus communis major*, are employed for lamp oil, and the small seeds of the variety *Ricinus communis minor* yield the medicinal castor oil.

1,506. Ricinus communis major. Dr. G. Bidie. Madras.
1,507. Ricinus communis minor. Dr. G. Bidie. Madras.
3,623. Castor oil seed. Oude.
979. Castor oil seed. Nagpur.
5,959, 5,962. Castor oil seed. Baroda.
6,053. Castor oil seed. Dharwar.
6,131. Castor oil seed. Ahmednugger.
6,266. Castor oil seed. Khandeish.
2,778. Ricinus communis minor. India Museum, London.
2,779. Ricinus communis major. India Museum, London.

POPPY SEED.

Papaver somniferum.

The seeds yield by expression about 50 per cent. of a bland and very valuable oil, of a pale golden colour, fluid to within 10° of the freezing point of water. It dries easily, is inodorous, of agreeable flavour, and partially soluble in alcohol. The seed is worth about 61*s.* in the English market. By simple exposure to the rays of the sun in shallow vessels the oil is rendered perfectly colourless. It is expressed by means of a heavy circular stone, placed on its edge, made to revolve by a long lever, and the apparatus is worked by draught bullocks.

The seed has no narcotic qualities, but has a sweet taste, and is used, parched, by the lower class of natives as a food; it is also much used by the sweetmeat-makers as an addition in their wares. This and the seed of the Teel (*Sesamum orientale*) are the only seeds, with the exception of the cocoanut, which are used for that purpose.

1,509. Poppy seed. Dr. G. Bidie. Madras.
8,823. Poppy seed. Shahabad.
817. Poppy seed. Berar.
852. Poppy seed. Indore.
3,570, 3,572. Poppy seed. Oude.
980. Poppy seed. Nagpur.
5,952, 5,978. Poppy seed. Baroda.
6,094. Poppy seed. Aden.
6,268. Poopy seed. Khandeish.
2,774. Poppy seed. India Museum, London.

SAFFLOWER.

Carthamus tinctorius.

These seeds yield by expression an oil which when properly prepared and refined is transparent and of a light yellow colour. It is used in India for culinary and other purposes. This oil deserves more attention than it has hitherto received in this country; and if once once fairly introduced, there is no doubt whatever of its becoming a staple import. It is used in some of the Government workshops as a "drying oil." It is believed to constitute the bulk of the celebrated "Macassar oil." The seed is exported under the name of Curdee or safflower seed. In Oude it is sown in October, either alone or along the edge of wheat crops; both light and heavy soils are adapted to it. It is cultivated in every village, but not extensively. There would be no difficulty in farther cultivating it to any extent. The cost of the seed, which is called "Barré," is 18¾ seers per rupee, and the cost of the oil is from 3 to 4 seers per rupee.

3,627. Safflower seed. Oude.
985. Safflower seed. Nagpur.
6,050. Safflower seed. Dharwar.
6,281, 6,135. Safflower seed. Ahmednugger.
2,721. Safflower seed. India Museum, London.

RAMTIL.

Guizotia oleifera.

These seeds of a composite plant are much esteemed as an oil seed, and, as such, enter into European commerce. The plant is commonly cultivated in Mysore and the Deccan. The oil is sweet tasted, and is used for the same purposes as Gingelly oil.

853. Ramtil. Indore.
2,749. Ramtil. India Museum, London.

TEEL OR GINGELLY SEED.

Sesamum Indicum.

Three varieties of sesame seed are cultivated in India—the white seeded (*Suffed-til*), the red or parti-coloured (*Kala-til*), and the black variety (*Tillee*); it is the latter which affords the greater proportion of the gingelly oil of commerce. At the commencement of 1861, white seed was worth in the London markets, 65*s.*; black and brown, 58*s.* and 60*s.* per quarter.

A second sort of sesame oil, sometimes called "Rape," is obtained from the red-seeded variety.

Black sesame is sown in March, and ripens in May. *Red* sesame is not sown till June.

Sesamum seed has of late been exported largely to France, where it is said to be employed for mixing with olive oil.

Gingelly oil is largely employed by the natives of India. The seed, as well as the oil, is exported in large quantities.

6,058, 6,071. Til seed. Dharwar.
6,096. Til seed. Aden.
6,130. Til seed. Ahmednugger.
6,217. Til seed. Tanna.
1,505. Teel seed. Surg. Bidie. Madras.
8,823*a*. Black Til. Rajshahye.
8,827. White Til. Attia.
8,815. Til plant. Rajshahye.
399. Til seed. Moolo Wariram. Tatta. Sind.
830. Black Til. Berar.
831. White Til. Berar.
854. Til. Indore.
3,415. Til. Kashmir.
3,428. Til. Kangra.
3,582, 3,588. Til. Oude.
6,265, 6,276, 6,272. Til. Khandeish.
983. Til, black. Nagpur.
984. Til, white. Nagpur.
5,906, 5,940. Til seed. Kattyawar.
5,944, 5,948, 5,955. Til seed. Baroda.
2,787. Til seed. India Museum, London.

CRESS SEED.

Lepidium sativum.

This plant is cultivated to a very limited extent in India for the sake of its oleaginous and medicinal seed.

6,090, 6,091. Cress seed. Aden.
2,760. Cress seed. India Museum, London.

BLACK CUMIN SEED.

Nigella sativa.

The seeds of *Nigella* are well known as a spice in all Mahommedan countries. In India they are produced to a limited extent, and yield by expression a clear limpid oil.

3,599. Black cumin. Oude.
2,773. Black cumin. India Museum, London.

ONION SEED.

Allium sativum.

It is somewhat rare, even in India, to meet with oil expressed from the seeds of the onion and garlic, but samples may sometimes be seen and smelt, for the latter at least has a strong characteristic odour.

6,093. Onion seed. Aden.

GROUND NUT.

Arachis hypogœa.

The ground nut is extensively cultivated in various parts of India; the kernels yield about 44 per cent. of a clear pale yellow oil, which is largely used as food, and as fuel for lamps. The value of ground-nut kernels in London is about 16*l.* 10*s.* per ton, and of the oil 42*l.* to 43*l.* per ton. For ordinary purposes it is quite equal to olive oil.

1,508. Ground nuts. Dr. G. Bidie. Madras.
821. Ground nuts. Berar.
877. Ground nuts. Indore.
6,264. Ground nuts. Khandeish.
2,704. Ground nuts. India Museum, London.

MOWHA NUTS.

Bassia latifolia.

The fatty substance obtained from the kernels of this fruit is an article of common consumption in India, and may often be met with under the names of Mowha or Yallah oil in the London market. The tree grows wild in the Taree, and is also planted in groves in most parts of Oude, near villages, &c. Its cultivation can be extended almost indefinitely, and it thrives without any trouble. Its flowers have a thickened and enlarged tube, in which is contained a considerable amount of sugar. They are dried and eaten by the natives, and also fermented for the manufacture of *Mowhah Spirits*. The cost of the oil extracted is 3 rupees per maund. The proportion of oil yielded by native process is about half the weight of the seed; used only for burning.

986. Mowha nuts. Nagpur.
2,710. Mowha nuts. India Museum, London.

COTTON SEED.

Gossypium herbaceum.

Cotton-seed oil when first expressed is thick, and very dark coloured, but at length methods have been devised for rendering the oil pure, clear, limpid, and of a delicate amber colour. Woolly seed, like the indigenous cotton seed of India, is not so good for oil.

3,418. Cotton seed. Kashmir.
3,425. Cotton seed. Kangra.
977. Cotton seed. Nagpur.
2,748. Cotton seed. India Museum, London.
7,271, 7,272, 7,273, 7,275. Cotton seed. Bombay Committee.

AMBADEE.

Hibiscus cannabinus.

This plant is extensively cultivated for the sake of its fibre, and the seeds are occasionally expressed for oil.

6,286. Ambadee. Kolkapoor.
6,269. Ambadee. Khandeish.
6,042. Ambadee. Dharwar.
2,750*a*. Ambadee. India Museum, London.

PURGING NUTS.

Jatropha curcas.

These euphorbiaceous seeds yield a valuable oil, which has for some time been known to a limited extent in the English market.

2,757. Purging nuts. India Museum, London.

SOAP NUTS.

Sapindus emarginatus.

These hard globose, shining, black nuts are sometime strung as beads. The shells being used as a substitute for soap. From the kernels an oil is extracted.

2,783. Soap nuts. India Museum, London.
2,104, 2,150. Soap nuts. Madras.

CASHEW NUTS.

Anacardium occidentale.

The sweet edible kernels of this nut also afford a bland oil.

2,700. Cashew nuts. India Museum, London.

KURUNJ.

Pongamia glabra.

These are the seeds of a leguminous tree, which yield a thick greenish, but probably useful oil.

2,775. Kurunj. India Museum, London.

SECTION II.—ANIMAL PRODUCTS.

A.—SILK COCOONS.

Silk culture, although known in India from very ancient times, was only established on a firm basis by the energetic patronage and assistance of the East India Company. The Company's trade in silk was confined to the province of Bengal, and before the middle of the eighteenth century was inconsiderable; the silk was moreover inferior in quality, being wound from the cocoons and reeled into skeins in the rude manner immemorially practised by the natives of India. The industries on which the production of marketable silk depend are mulberry cultivation, worm-rearing, and silk-reeling.

Although the silkworm is undoubtedly a native of China, yet there are several distinct species indigenous in India which yield silk, also quite distinct from those of China.

The worms reared appear to have been of three kinds :—the *bara palu*, an annual worm, introduced early in the 18th century, probably from China or some country bordering thereon; the *desi palu* or indigenous worm, a multivoltine; and the *nistri*, a species of uncertain origin and apparently less widely distributed than the other two. All these worms were fed for the most part on the leaves of the Morus *indica*, the plant being kept down to the size of a shrub by continual pruning.

In 1769, enegetic and successful efforts were made by the East India Company, in the improvement and extension of silk culture, by the introduction (1) of the exact mode of winding practised in the filatures of France and Italy, and (2) of the China worm and mulberry plant. The cultivation of the mulberry was also urged upon the Zemindars, or landholders, and encouragement given in the clearing of lands suited to this purpose. Large exportations, amounting to nearly twice the weight of the English importations from France and Italy, were the results of the improvements in winding; but in consequence of the diminished consignments of raw silk in 1812, further steps were taken to obtain an increased supply; experiments attended with more or less success were instituted at Santipore, in 1826, and at Howrah in 1831. In 1866, the Agri-Horticultural Society of India, a society which has always exerted itself vigorously in directing attention to and encouraging improvements in the cultivation of the great staples of Indian commerce, successfully introduced the Japanese silkworm, the silk from which is stated to be nearly equal to that of the Italian worm. At the present time the production of mulberry-worm silk in the lower provinces (excluding Assam) seems to be confined to the districts of Rajshahye, Maldah, Moorshedabad, Midnapore, Beerbhoom, Hooghly, Burdwan, Bograh, Howrah, Nuddea, Jessore, and the 24 Pergunnahs, the first five are the great silk producing districts. In the district of Rajshahye there are 97 filatures, containing 5,760 basins, and employing between 11,000 and 12,000 hands. Of the 97 filatures, 34 are owned by Europeans, the remaining 63 by natives. The average yield of raw silk is estimated at about 400,000 lbs. per annum, and it is believed that no less an area than 150 square miles is under mulberry cultivation, while a quarter of million of people derive their support from the industry in one or other of its branches in this district alone. It is worthy of note that the English imports of Bengal silk amounted in 1829 to 1,387,754 lbs.; in 1835, a few years after the cessation of the East India Company's trade with India, 727,535 lbs. only.

For the last thirty years, however, the quantity of raw silk exported from Bengal has not varied much, being about 1,500,000 lbs.; on the other hand, the exports from China and Japan have enormously increased. While the exports of Bengal silk have remained almost stationary, the price has nearly doubled. The rise is undoubtedly to a great extent due to the introduction of European improvements in the system of reeling. Still the prices decidedly rule below those of China and Japan, and, *à fortiori*, below the better Italian and Bruttia silks. The exports of country-made silk piece goods have greatly declined.

In southern India, silk culture is carried on at Mysore, a class of Mahomedans being engaged in the production; although of late years the industry has suffered from the ravages of the silkworm disease. The cultivation has spread though but slightly to the neighbouring districts in the Madras Presidency, as Salem and Coimbatore.

Silk is also produced in Assam, Burmah, and Cashmere, chiefly for local use, however.

The occupation of silk culture in British Burma is a lucrative one, and many parts of the country are admirably adapted for it. That under these circumstances the occupation is not more extensively followed than it is, is due mainly to the Buddhistic prejudice against the taking of life, the manufacture of raw silk of the best quality involving the death of the chrysalis in the cocoon. Thus, the silk-growers live in villages by themselves, holding but little social intercourse with their neighbours, for fear of being taunted with allusions to the wickedness of their calling.

Repeated attempts have been made to introduce the silk-culture into the Punjab, but without any definite success, as yet; the industry has established itself in Goordaspore, where natives, especially Mahommedans, are engaged in the production.

In Berar, Oudh, Dharwar, and other parts of India, silk culture seems capable of great extension, the climate being adapted both to the cultivation of the mulberry, which abounds in many districts, and to the rearing and thriving of silk-worms.

Quantity and value of Raw Silk exported from India in the official year 1871–2.

From	lbs.	Rupees.
Bengal	2,174,344	13,229,993
Burmah	1,260	4,050
Madras	1,516	9,373
Bombay	55,945	150,833
Sind	1,683	9,507
	2,234,749	13,403,756

BENGAL COMMITTEE.

8,345. Cocoons of "Arindi" moth (Attacus ricini). From Dinagepore. Not an article of commerce; cultivated by Mussulman ryots, in small quantities, near their houses. 2 annas per seer of 2 lbs.

8,346–7. Larvæ of the Arindi moth, and of the common silk moth (Bombyx mori). From Bogra.

8,348–9. Eggs, moth and cocoons of Atticus ricini from Bogra and Rungpore.

This moth, which feeds on the castor oil plant, is locally named "Indi" or "Arindi," is peculiar to the districts of Rungpore, Dinagepore, and Bogra, and to Assam.

8,350–54. Tusser cocoons (Antheræa paphia), from Beerbhoom, Bhaugulpore, Midnapore, Khurda in Orissa, and Nya Doomka, Sonthal Pergunnahs.

Tusser is generally Antheræa paphia, but several species are perhaps joined under the same name. The worm feeds on the "ber," the "Sâl," the "Simal," and the vaious species of Terminalia. In Midnapore the worms are placed on the "Asun" tree, after being bred in the house. All the inhabitants of the jungles rear the worm. The silk manufactured sells for 10 rupees to 13 rupees the seer (2 lb.). The eggs are collected, and the larvæ let loose on the trees ("*Asun*," "*Sal*," and "*Asta*," of the jungle tracts), from which the cocoons are afterwards collected. The lowest castes form the right to collect from the Zemindars, and sell the cocoons to winders and weavers.

8,355–7. Cocoons of Bombyx moths from Rajshahye, Midnapore, and Berhampore.

The ordinary silk moth reared in Bengal is generally identified with *Bombyx Mori*, but *B. Mori* occurs *nowhere in the lowland Gangetic provinces*, and its name is assigned to all the under-mentioned species of Bombyx (*textor*, *Cræsi*, *fortunatus*, *Sinensis*, *Arracanensis*, *Bengalensis*, &c.).

8,358–60. Cocoons of Tusser moth of the varieties called "Ampathi," or "Ampatia fuki," "Dava," and "Baghai," from Purulia, Maunbhoom.

These names refer to the colour of the worms. Ampathi, "mango leaf;" Dava, "white" (from Dhavala); Baghai, "tiger-like," *i.e.*, striped.

8,361–2. Arindi Cocoons from Rungpore and Kishoregange, Mymensing district.

8,363–71. Specimens of the cocoons of the Moonga, Eria, and Barpat worms, with and without Chrysalis, from Nowgong, Upper Assam.

The "Mooga" or "Moonga" worm of Assam (Antheræa Assama) reared on a species of *Laurus*, produces a good quality of silk, to which, however, the carding process used by the natives does not do justice. It is of opinion that if it were well reeled by skilful hands, the silk would be excellent and extremely valuable. The "Pat" is a Bombyx worm (*B. textor*). The silk, the use of which was at one time confined to royalty, is very highly thought of. The "Eria" worm (Attacus ricini) yields the coarse silk, from which the dresses of the poorer classes are made. The "Pat" worms are said to be bred by the Joogee class; the Moonga and Eria by low caste Hindoos, Mikirs, and Cacharees.

F. Moore, India Museum, London.

A case containing the principal silk producers of India.

1. *Bombyx Mori*. Moths. Cocoons and Silk. Cashmere.

2. *Bombyx Mori* (Hybrid or cross between *Cashmere* and Bengal *Nistry*). Cocoons. Bengal.

3. *Bombyx Mori* (Hybrid, or cross between Bengal and French). Cocoons. Bengal.

This is the largest of the mulberry-feeding silkworms. It came originally from China. Cultivated in one or two localities of the Northern Punjab near the hills, it thrives well at Mussooree, and is the species reared in Cashmere, Afghanistan, and Bokhara. It is an annual, and produces the best silk of all. Cocoon golden yellow (when in health.)

4. *Bombyx Cræsi*. (The *Nistry* or *Madrassee* of Bengal.) Cocoons, &c. Bengal. This is the largest of the multivoltine species, and is cultivated in several parts of India. Cocoon, golden yellow. Silk good.

5. *Bombyx textor* (the *Burra pooloo* of Bengal). Cocoons, &c. Tinnevelley.

Originally from China. Cultivated sparingly in several parts of India, but its constitution is thoroughly worn out, and it is fast fading away from Bengal. An annual Cocoon, white (in health, yellow).

6. *Bombyx fortunatus* (the *Dusee* of Bengal). Moths, cocoons, and silk. Bengal.

Distributed over Bengal and parts of Southern India. A polyvoltine. Cocoon, small, golden yellow. Silk good.

7. *Bombyx Sinensis* (the *Sina* or small Chinese of Bengal).

Originally from China. Cultivated in parts of Bengal. A multivoltine. Cocoons varying in colour, being sometimes yellow, white, or with a faint greenish hue.

8. *Bombyx* (*Theophila*) *Huttoni* (the wild mountain silkworm). Worm, cocoons, and moth. N. W. Himalaya.

Feeds upon the indigenous mulberry of the N. W. Himalaya (Simla, Mussooree, and Almorah). Discovered and experimented upon by Captain Hutton. An annual. Cocoon, whitish. Silk, strong and soft.

9. *Antheræa paphia* (Tusser silkworm). Worm, cocoons, and moths.

The Tusser silkworm is the most important and widely distributed of all the wild silk-producing insects of India, being found in the sub-Himalayan tracts almost throughout the entire range; on the hills from Assam to Chittagong, in the Soonderbuns, everywhere in the great belt of hill and forest inhabited by the Sontal, the Kol, the Khond, and the Gond, on the Western Ghauts, and in portions of the Madras and Bombay Presidencies.

The worm is multivoltine, and feeds variously on the Ber (Zizyphus jujuba), country almond (Terminalia catappa), Asun (T. Alata), Saj (T. tomentosa), Seemul (Bombax heptaphyllum), Sal (Shorea robusta), and other trees.

Its utilization appears to date centuries back. In some districts the worms are regularly reared and tended, in others the cocoons are simply collected from the forest trees on which they are found, sorted, and sold to the dealers.

The method of reeling is primitive in the extreme and to its imperfections is attributed the scant attention this valuable and beautiful silk has hitherto received.

10. *Antheræa Assama* (Moonga silkworm). Worms, cocoons, moths. Assam.

The Moonga silkworm, the cultivation of which is confined to Assam, ranks next in importance to the Tusser worm. Five broods are produced annually, the worms being carefully reared upon either of the following trees:—Champa (Michelia sp.); Maizan-

kurry (?Tetranthera quadriflora); Soom (Tetranthera sp.); Soonhalloo (Tetranthera macrophylla); Digluttee (Tetranthera diglottica); Pattee-hoonda (Laurus obtusifolia). The cocoon is large, and the silk which is coarsely reeled, varies from white to fawn colour, that produced from the worm reared on the Champa (Michelia sp.) being the whitest and most esteemed. Fifty thousand cocoons (a good yield for an acre of ground) are estimated to yield upwards of 12 seers of silk, valued at from 3½ to 12 rupees per seer. The silk forms one of the chief exports of Assam, and leaves the country principally in the shape of thread, most of it going to Berhampore. The total quantity produced in the province may be estimated at from 600 to 700 maunds, of which the greater portion is generally reserved by the Assamese for their own use.

11. *Attacus Ricini* (Eria silkworm). Worms, cocoons, moths, &c. Assam.

The *Eria* or *Arindy* silkworm (*Attacus Ricini*) is reared in Assam, and certain districts to the south-west of that province.

The worms which are reared chiefly in the houses of low caste Hindoos, Mekirs, and Cacharees, are fed principally on the leaves of the castor oil plant (Ricinus communis), and yield seven or more broods in the year. The silk is generally of a light rust colour, sometimes white, and is carded, not reeled in consequence of the resinous nature of the binding matrix of the cocoon.

The use of the silk is chiefly local.

The district of Durrung alone produces 1,000 maunds annually, which is valued at 2 to 3 rupees the seer.

B.—WOOL.

Pashm, or Shawl-wool, properly so-called, is a downy substance growing next the skin and under the thick hair of the goats inhabiting Tibet and other elevated regions to the north of the Himalayas. It is obtained in the following manner:—the hair of the goat is first cut short with a knife in the direction of its growth, or from the head towards the tail; a kind of comb is then passed in the reverse direction, and brings away the finer wool almost unmixed with the coarse hair. It is cut once a year, and if not shorn as the summer commences the animals themselves rub off the wool. The Pashm is of three colours, white, drab, and dark grey.

It comes almost entirely from Yarkand and Changthan (Chinese Tibet). From the former country is brought the fine Turfani wool, which is the most valuable. By ancient custom and engagements the export of this wool, until recently, was exclusively confined to Kashmir, it being a monopoly of the Maharaja of that country, and all attempts to convey it to other countries were punished by confiscation. In like manner it was considered illegal in Rodokh and Changthan to allow a trade in shawl-wool except through Ladakh. Prior to 1867 none of the fine Turfani *pashm* was allowed to pass through the Maharaja's territory into the British provinces. The Amritsur and Ludiánah looms were consequently worked chiefly with a fine *sheep's wool* from Kerman, called *wahab shahi*, which, however, by no means comes up in softness and other qualities to the shawl-goat's down.

A considerable amount of *pashm* from Changthan always comes down to the Punjab, but this is much inferior to that of Turkistan. In these days a good deal of shawl-wool is brought by different paths on sheep to Rampur, and sent from thence to the Kashmir colonies of the Punjab, Rampur being a great mart for the reception and forwarding of wool; but even now, when free importation of shawl-wool is allowed, the cheaper Kermani wool still holds its own with the Punjab weavers, hence the greater part of it still goes to Kashmir. This is one of the reasons for the inferiority of the shawls made in the British provinces to the beautiful fabrics of the Kashmir valley.

This industry was seriously affected by the late Franco-German war, and *pashm* of all kinds sank in value. Lately, however, the trade has revived, the supplies in the market being now insufficient.

In 1870 the amount of *pashm* or shawl-wool imported into Leh in Ladakh was as follows:—

Pure white *pashm* from Yarkand 198 maunds; pure white *pashm* from Changthan, 794 maunds, valued (at the current rate of Rs. 60 per maund of 80 lbs.) at Rs. 59,526; black *pashm* to the extent of 92 maunds, valued at Rs. 40 per maund, at Rs. 3,680. In the same year the amount of *pashm* exported from Ladakh to the Punjab was as follows: *viâ* Kullu, 12 maunds, and *viâ* Kashmir, 24 maunds.

Sheeps' wool is largely used in the textile manufactures of India, and in addition constitutes an important article of export. Nevertheless the quantity of wool actually produced in India itself is comparatively small. The native looms of the Punjab are therefore supplied to a great extent with wools imported from beyond the frontier; the wool also which is exported from India is almost entirely of non-Indian origin.

Of the wools imported into India the finest is that which comes from Tibet, the cold climate of that region conferring on the fleece the peculiar fineness of quality found in the shawl-wool of the Tibetan goat. Large quantities of wool are imported into Leh in Ladakh from Changthan. The most important varieties of wool imported from the N.W. frontier are:—

1st; that of the *Dumba*, a large-tailed sheep common in Cabul, Peshawur, and other neighbouring districts. It is used in the manufacture of the finer sorts of *Chogas*, an outer robe or cloak with sleeves worn by Affghans and other Mahomedans of the Western frontier. The trade in this wool is very extensive, both by the Peshawur and other routes; the export trade of Karrachee and Bombay is supplied more especially from this source.

2nd. *Wahab Shâhi* or *Kirmani Wool*, a beautiful white soft wool produced at Kirman, a tract of country in the south of Persia by the Persian Gulf.

Its principal use appears to be the adulteration of genuine *Pashm* or goats' wool of which Kashmere shawls are made, and in the manufacture of a spurious kind of shawl cloth. It is largely used in Persia in the fabrication of "janewars," which have superseded the use of Kashmere shawls in that country.

The wool is soft and delicate, long in the staple, and much more easily and quickly worked than the

more delicate goats' wool. It is imported into the Punjab in considerable quantities.

Wool is produced in the Punjab, also to some extent in Rajpootana and Kutch, and in the hill districts of Mysore and other parts of Southern India.

The large flocks of the *Thull* and *Bar* tracts of the Punjab, the arid and elevated interior parts of the Doabs, are computed to yield annually upwards of 400 tons of wool, of which probably two-thirds are exported, the remainder being consumed in the manufacture of blankets and felts. The fleece of the Thull sheep has the reputation of being the finest in the Punjab. The sheep are sheared twice a year (April and October), the average yield of each separate shearing being about 1½ pounds. The head quarters of the wool trade is at Noorpore in the Thull.

With the exception of Kunawur in Bussahir, scarcely any wool is produced in the Simla district and the Hill States. The wool is brought from Kunawur in large quantities to the annual fair at Rampur.

Camel's hair is produced in the *Bar* and *Thal* or waste tracts of Shahpur, Rohtak, Shang, and Gugaira, which are camel-feeding districts. The soft underwool which is of a light brown colour, is used for the manufacture of cloth for chogas of a common kind.

An immense number of camels are employed by the merchants who carry on that portion of the trade of India with Central Asia which finds its egress and ingress on the borders of Scinde.

The Yak, in common with other animals of Tibet, is provided with the fleece of *pashm* wool, as a protection against the severe cold. This *pashm* is a great article of trade; almost all of it finds its way to Kashmir, where it is manufactured into cloth. The coarser kind of wool or hair is made into bags for carrying grain, &c., ropes, and other articles.

Large herds of Yaks are used by the nomad Tartars as beasts of burden in their trading operations; they load them with borax, salt, &c., which they bring across the Himalayas, and dispose of to the inhabitants on our side of the mountains, in exchange for grain, cloth, and *other commodities.*

Quantity and value of raw wool exported from India in the official year 1871–2.

From.	Lbs.	Value. Rupees.
Bengal - -	1,667	2,843
Burmah - -	—	—
Madras - -	—	169
Bombay - -	22,085,700	79,69,837
Sind - -	11,377,771	25,26,033
	33,465,138	104,98,882

Indore Local Committee.

Specimens of wool, washed and unwashed.

Washing the wool is a very tedious process. It is spread on a plank which is slightly sloped, hot water is then poured on the wool, which is at the same time beaten with a flat stick. Care is taken not to entangle the fibres of the wool; which, when clean, is spread out to dry. It is absolutely necessary to wash wool on a sunny day, or it is likely to get entangled if left wet for a long time.

India Museum, London.

Specimens of shawl wool or Pashm (Capra hircus) from Cashmere, Axoo Pashm (Capra sp.?) from Leh, Ladakh, Cashmere goats' wool (Capra sp.?), cleaned, from Amritsur.

Samples (5) of Cabul goats' wool (Capra sp.?), white, red, and black from Amritsur.

Specimen of goats' wool (Capra sp.?), raw.

Specimens of sheeps' wool, Ovis aries (variety), from Khelat and Tibet.

Specimens of sheeps' wool, Ovis aries (variety), from Mysore.

Specimens of sheeps' wool, Ovis aries (variety), from Beckaneer, Guzerat, Sind, and Cutch.

Specimen of lambs' wool, from Jesselmere.

Sample of Wabab Shahi wool, Ovis aries (variety), cleaned, from Amritsur.

Samples of camels' hair (Camelus dromedarius) from Indore and Hyderabad, Sind.

Specimen of Yaks' hair (Poephagus grunniens) from Tibet.

C.—SKINS, FEATHERS, BRISTLES.

Bombay Committee.

6,582. Ape skin, No. 1. Aden.
6,583. Ape skin, No. 2. Aden.
6,584. Bullock hide, No. 1. Kathawar.
6,585. Bullock hide, No. 2. Kathawar.
6,586. Bullock hide, No. 3. Kathawar.
6,587. Zebra hide. Aden.
6,588. Lion hide. Aden.
Ostrich feathers. Aden.

India Museum, London.

Marabou feathers. From Calcutta.

Marabou feathers are the under tail-coverts of the Adjutant or Gigantic Stork (*Leptoptilos argala*), and of the smaller Adjutant (*L. javanica*). The former species is extremely common in Northern India, more especially in Bengal, and is well known in Calcutta and other large towns as an efficient "scavenger" bird.

D.—HORN, IVORY, TORTOISESHELL.

Horns of various kinds form an extensive article of export from India, as the following statistics will show:—

Quality and value of horns exported from India during the official year 1871–2.

From.	Cwts.	Rupees.
Bengal - - -	12,758	1,67,636
Burmah - - -	65,197	38,540
Madras - - -	18,857	1,76,168
Bombay - - -	—	2,55,404
Sind - - -	112	1,108
	96,924	6,38,856

Rai Pritheeram Chowdry Bahadur, Zemindar of Meckpara.

Elephant tusks (4), and Rhinoceros' horns (2), from Gowalpara.

Colonel Michael, Madras.

Elephant tusks (2).

India Museum, London.

Gour horns, polished. (*Gavæus gaurus.*)

E.—LAC, AND MISCELLANEOUS.

Stick-lac consists of the crude resinous incrustation formed by the female lac insect upon the small branches of several trees and shrubs of different kinds, being found more or less abundantly throughout the forest districts of India, Burmah, &c.

Stick lac. *Coccus lacca*, Linn. Laak, *A.* Laksha, *Sans.* Lakh, *H., Guz.* Komburruki, *Tam.* Kommu-lakka, *Tel.* Khjeijk, *Burm.* Balo, *Java.* Ambalau, *Malayalam.*

8,505. Stick lac. Bengal.
1,004. Stick lac. Nagpore.
3,459. Stick lac. Punjab.

Jardine, Skinner, and Co., Mirzapore.

3,648. Stick lac.

Wemyss, Sir J., Mirzapore.

Stick lac.

G. Bidie, Madras.

1,593. Stick lac.

Bangalore Central Jail.

973. Stick lac. Nagpore.
1,004. Stick lac. Nagpore.

India Museum, London.

Stick lac.
Stick lac. Mirzapore.
Stick lac. Bancoorah, Bengal.
Stick lac. Assam.
Stick lac. Burmah.
Stick lac (from Zizyphus jujuba). Ahmedabad.
Stick lac (from Urostigma religiosa). Ahmedabad.
Stick lac. Vizagapatam.
Stick lac. Chittuldroog, Mysore.
Stick lac (from Vatica laccifera). Nundidroog, Mysore.
Stick lac. N. India.

Local Committee, Central Provinces.

1,004. Lac.

India Museum, London.

Edible birds' nests. *Collocalia nidifica*, Lath. Gnat-thiet, *Burm.* Akyab, *Burmah.* Yen-wo, *Chinese.*

The edible birds' nests are largely collected from the rock caves along parts of the Burmese coast, the Andaman and Nicobar Islands, for exportation to China, where they are considered a great luxury as an article of food.

The nest is composed of inspissated mucous from the large salivary glands with which these birds are provided.

India Museum, London.

Sharks' fins. *Rhynchobatus lævis*, Müll. Gnamayat, *Burmese.* Soora-meen-sepputtay, *Tam.* Paak, *H., Guz, Dec.* Cheeraparagoo, *Travancore.* Jyu, or Yu, *Malays.* Bombay.

Shark fins are largely exported from Bombay and Madras to China, where they are much esteemed, being used for the making of soups. So large is the consumption, that from 7,000 to 10,000 cwts. are annually exported there from Bombay. These fins are assorted into the "white" and the "black," the former being the dorsal fins, which are uniformly light coloured on both sides, and are reputed to yield more gelatine than the other; the "black" fins are the pectoral, ventral, and anal fins; this variety is less esteemed than the white, and consequently realises a lower price.

India Museum, London.

Chank Shells. *Turbinella pyrum*, and *T. rapa.* Sunk, *Dec.* Sungoo or Sankka, *Tam.* Shenkoo or Senkham, *Tel.*

These shells form a considerable article of trade in India, where they are in extensive demand all over the country, principally for the purpose of manufacture into bracelets, and are worn as ornaments for the arms and legs by Hindoo women. They are fished up by divers in the Gulf of Manar on the coast opposite Jaffnapatam in Ceylon, in about two fathoms water, and at Travancore, Tuticorin, and other places.

F.—MANURES.

H.H. the First Prince of Travancore. Specimen of manure from Travancore.

NOTE.—For other Manures see Cotton Collection from Exhibition, 1872.

SECTION III.—FORESTRY.

(From Report on the Moral and Material Progress of India during 1871–2, by Clements R. Markham, C.B.)

The Forest Departments in most provinces in India have not been in existence for more than 15 years, and much will have to be done, many difficulties and obstructions must be removed, before they will be in thoroughly effective working order. The importance of their work, is, however, beginning to be understood, and when the forest revenues largely increase, the value of conservancy will be recognised, even by the numerous class which looks upon any thought for future generations as a waste of time and money.

Probably the most important, though indirect, object of forest conservancy is the natural influence exercised by trees on the drainage of a country. Where the mountains are bare the rain rushes down in torrents, destroying roads and bridges, giving rise to destructive floods at the outlets on the plains, and doing other injuries, both in the hill tract and the plains, and the supply of water is uncertain and capricious during the dry season. On the other hand, where the forests are preserved, the superficial drainage and dry weather discharge are both gradual, the springs are better supplied, and regularity and safety are insured to irrigation works on the plain.

The direct objects are, first, to meet a rapidly increasing demand throughout India for enormous supplies of timber and fuel. The cultivators, as their condition improves, require to exchange miserable huts for better-built houses and better furniture. There is an immense demand for railway sleepers, for fuel for steamers and railways, and for timber and fuel for large towns. The interests of trade, which have a direct bearing on the prosperity of the people, also require consideration, in order to meet the demand for teak, sandal-wood, catechu, lac, caoutchouc, and other forest products. The rapid increase in the magnitude of these demands is strikingly shown by the effect it has had on the export timber trade in some parts of India.

Unless the small extent of remaining available forest is very carefully managed, there will be great difficulty in meeting the demands for timber, bamboo, and fuel, which are increasing everywhere. In 1846 a department was organised in the Bombay Presidency under Dr. Gibson ; in 1856 Drs. Cleghorn and Brandis commenced work in Madras and British Burmah respectively. Dr. Cleghorn not only created the department in Madras, but also laid the foundation of forest administration in the Punjab, and was subsequently associated with Dr. Brandis in organising the Forest Department in Bengal. In 1864 Dr. Brandis was appointed Inspector-General of Forests to the Government of India.

It has been found necessary to retain as many important forest tracts as possible in the hands of the State for exclusive management, as it is impossible to control the forests efficiently when in private hands, and the Government forests offer the only means of training an experienced body of foresters with practical knowledge. The reserved forests are under the exclusive management of the department. But the largest portion of the forest area is still unreserved, and the people retain rights of pasturage, of destructive burning, of desultory cultivation, which is equally destructive, and of collecting products. These unreserved forests are generally under local district officers, and when well managed they yield a good revenue available for roads and other public improvements. Thus the forests under the control of Government are divided into three main divisions,—reserved forests, unreserved forests, and plantations. The forests reported to have been reserved and secured to the State cover 6,200,000 acres as compared with 6,000,000 acres in Prussia, 2,500,000 in France, and 112,000, comprising the Crown forests of England. Much time must elapse before the Forest Department in India can reach a really prosperous condition as regards financial results.

The great mass of the forests, owing to past neglect, is in a poor and exhausted state, and large sums must for a long time be annually spent on surveys, demarcations, boundaries, roads, and plantations. The income of the last three years has fluctuated

between 420,000*l.* and 465,000*l.*, and the highest annual net profit has been 160,000*l.* In 1871–2 the total revenue of Indian forests was 501,924*l.*, and the expenditure 354,616*l.*

In the part of Bombay, however, where the administration of forest lands was commenced in 1846, there is a large and steady revenue, fluctuating, in the last six years, between 82,000*l.* and 123,000*l.*, half of which is net profit. The objects of forest conservancy are not those of an opium monopoly or salt tax. They are to protect the land from destructive floods, to ensure supplies of timber and fuel, and to increase the well-being of the people. The surplus is a satisfactory incident in the management of forests, and it is a sign of that management being good and efficient; but an immediate revenue is not the object in forest conservancy.

Forest conservancy has had to struggle against numerous difficulties, arising from the immemorial practices of the natives, as well as from natural causes. The two most formidable of these obstacles to progress are jungle fires, and the clearing and burning the jungle for cultivation. A patch of forest is cut down and burnt, and a crop is raised in the open space, no ploughing or digging being necessary. In the following year the field is abandoned, and another patch of forest undergoes the same wasteful and lazy process. The damage done by these fires is incalculable. Millions of seeds and seedlings are destroyed, the bark of the trees are scorched, the wood is exposed to the air, and the trees become hollow and useless for timber. Thus a large proportion of trees in Indian forests are unsound, mainly owing to these fires. Steps have been taken to prevent them by isolating the tracts to be preserved, and this destructive system of cultivation has been prohibited in Mysore, part of the Madras Presidency, and a valuable forest in the Central Provinces. Another difficulty of the Indian forester is to clear the valuable timber trees of huge creepers, which completely enclose them with a network of branches, destroy their growth, and ultimately kill them.

In 1865 an Act was passed for the management and preservation of Government forests. Forest tracts may be rendered subject to the provisions of this Act by a Government notification, provided that no existing rights are affected; and the local governments are empowered to make rules, applicable to such tracts, for the preservation of trees, safe custody of timber, &c. Forest rules under the provisions of this Act have been drawn up for Mysore, Coorg, the Central Provinces, Berar, Oudh, and Burma. There are local rules for the Assam and Chittagong forests, for the Hazaribagh district, and for several forests of the Punjab and N. W. Provinces. Forest affairs are not yet sufficiently advanced in Bengal for any codified form of rules. The Act does not apply to Madras or Bombay, and the Madras Government has always declined to legislate on the subject, but Bombay has prepared a draft Forest Act of its own, which is under consideration. Meanwhile the main principles of forest conservancy are the definition and demarcation of reserved forests, the prevention of jungle fires, the exclusion of cattle, the opening of roads, and the cutting and clearing away of creepers and grass round the young trees.

Great progress has been made in the demarcation of reserved forests, which is the most important work in the department in the N. W. Provinces, Oudh, the Punjab, the Central Provinces, Bombay, and Sind; in Madras little progress has been made, and no systematic measures have been adopted for securing this great desideratum in forest management.

The existence of forests and their character mainly depends on climatic conditions of temperature and rainfall. In the arid tract of Sind and the Punjab, forests of babúl (Acacia Arabica) line the Indus at various points, which in Middle and Upper Sind are mixed with tamarisk and the Euphrates poplar, while *jhund* or *kundi* (*Prosopis spicigera*), an Acacia-like tree, *Salvadora*, and an arborescent leafless caper (*Capparis aphylla*), occupy vast tracts in rear of the babúl forests. The dry belt of the Punjab has woods on the high land between the rivers, called *rakhs*, also composed mainly of *Prosopis*, *Capparis*, and *Salvadora*. The woodlands of a portion of Rajputana are mainly composed of a beautiful tree, with small leaves and drooping branches, a species of Anogeissus; and the southern dry belt in Mysore is the region of sandal-wood

Outside the dry zones the teak extends over the peninsula to the northern slopes of the Vindhya Hills, while the *Sâl* (*Shorea robusta*), the most important timber-tree of India next to teak, forms extensive forests along the foot of the Himalayas, in the eastern part of the Central Provinces, the Rewah territory, and the adjoining districts of Bengal. Luxuriant evergreen vegetation is only met with in the two moist belts, the first extending along the Himalayan range to Burma and Tenasserim, the second along the western coast, and thence to the summit of the ghats. From the Himalaya come the supplies of pine and other coniferous trees. The deodar has its eastern limit in Kamaun, but it is succeeded by other coniferous trees, one of which, the *Pinus Khasiana*, extends into Burma. The *Ficus elastica*, yielding caoutchouc, is found along the foot of the Himalaya from Sikkim to Assam, and more sparingly at the foot of the Khasia and Cachar Hills. In Burma there are extensive forests of *Pinus Khasiana* on the high mountains; famous teak forests between the Salwen and Sitang, and the Calcutta magnificent evergreen forest vegetation in the moister valleys, where trees grow to a height of 200 feet. The Western Ghats are the region of teak and blackwood trees of poon spars and of other trees, such as angelly (an Artocarpus), vengay, and irul, yielding excellent timber.

A.—TIMBERS AND ORNAMENTAL WOODS.

29 Samples of Indian Woods used at Her Majesty's Gun Carriage Manufactory, Madras, exhibited by the Superintendent.

1,614. Ebony. Diospyros melanoxylon.
1,615. Trincomallee. Berrya ammonilla.
1,616. Bambooray. Careya arborea.
1,617. Pingadoo. Inga xylocarpa.
1,618. Seet. Albizzia elata.
1,619. Johore Teak. Tectona grandis species.
1,620. Ooroopoo. Cynometra ramiflora.
1,621. Murthy. Terminalia coriacea.
1,622. Sissoo. Dalbergia sissoo.
1,623. Malabar Teak. Tectona grandis.
1,624. Rosewood. Dalbergia latifolia.
1,625. Johore Oak. Quercus species.
1,626. Anamallay Teak. Tectona grandis.
1,627. Australian Gum. Eucalyptus piperita.
1,628. Daroo. Vatica species.
1,629. Satin. Chloroxylon swietenia.
1,630. Khair. Acacia catechu
1,631. Babool. Acacia arabica.
1,632. Karal-bogi. Bauhinia variegata.
1,633. Crangee. Dipterocarpus species.
1,634. Peethan. Spathodea stipulata.
1,635. Pegu Teak. Tectona grandis.
1,636. Thumbagum. Vatica thumbagaia.
1,637. Peddowk. Pterocarpus dalbergioides.
1,638. Pawoon. Berrya mollis.
1,639. Tampean. Artocarpus echinata.
1,640. Palla. Mimusops hexandra.
1,641. Peemah. Lagerstræmia reginæ.
1,642. Saul. Shorea robusta.

13 Samples of Woods used on the Madras Railway, exhibited by R. B. Elwyn, Esq.

1,643. Rosewood. Dalbergia latifolia.
1,644. Sedachoo. Grewia tiliæfolia.
1,645. Mango. Mangifera indica.
1,646. Satin. Chloroxylon swietenia.
1,647. Ven Teak. Lagerstræmia macrocarpa.
1,648. Moulmein Teak. Tectona grandis.
1,649. Palmyra. Borassus flabelliformis.
1,650. Peengaudoo. Mimosa xylocarpa.
1,651. Murthy. Terminalia coriacea.
1,652. Venga. Pterocarpus marsupium.
1,653. Malabar Teak. Tectona grandis.
1,654. Thumbagum. Vatica tumbagaia.
1,655. Trincomallee. Berrya ammonilla.

6 Samples of Woods used in Carriage building, exhibited by Messrs. Simpson & Co., Madras.

1,656. Trincomallee.
1,657. Satin.
1,658. Teak. Tectona grandis.
1,659. Chittagong.
1,660. Benteak.
1,661. Mango. Mangifera indica.

30 Specimens of Woods from Southern India, exhibited by the Central Museum, Madras.

1,662. Artocarpus integrifolius. *Eng.* Jack wood; *Tam.* Palah marum; *Tel.* Panasa kurra. From Coimbatore.
1,663. Azadirachta indica. *Eng.* Margosa wood; *Tam.* Vepa marum; *Tel* Vepa kurra. From Masulipatam.
1,664. Bassia longifolia. *Eng.* Bassa wood; *Tam.* Illoopai marum; *Tel.* Ippa kurra. From Coimbatore.
1,665. Borassus flabelliformis. *Eng.* Palmyra wood; *Tam.* Panai marum; *Tel.* Tatti kurra.
1,666. Chickrassia tabularis. *Eng.* Chittagong wood; *Tam.* Chitykam marum; *Tel.* Chetakum kurra. From Masulipatam.
1,667. Chloroxylon swietenia. *Eng.* Satin wood; *Tam.* Kodawah porasoo maram; *Tel.* Billa kurra. From Coimbatore.
1,668. Cordia angustifolia. *Eng.* Naroovillee wood; *Tam.* Naroovillee maram. From Coimbatore.
1,669. Dalbergia latifolia. *Eng.* Veeroogoodoo Chava wood. From Masulipatam.
1,670. Diospyros ebenum. *Eng.* Ebony wood; *Tam.* Kakatatee maram; *Tel.* Toommeka chava kurra.
1,671. Feronia elephantum. *Eng.* Woodapple tree; *Tam.* Villan maram; *Tel.* Volaga kurra. From Coimbatore.
1,672. Ficus glomerata. *Eng.* Athee wood; *Tam.* Athee maram; *Tel.* Athee kurra. From Coimbatore.

1673. Ficus religiosa. *Eng.* Pepul or Poplar leaved fig tree; *Tam.* Arasa maram; *Tel.* Rangee kurra. From Coimbatore.
1,674. Gmelina arborea. *Eng.* Tella Goomoda wood; *Tel.* Tella Goomoodoo kurra. From Masulipatam.
1,675. Guatteria longifolia. *Eng.* Long leaved Gnatteria; *Tam.* Aswada maram; *Tel.* Aswada chettoo. From Pondicherry.
1,676. Inga dulcis. *Eng.* Caroockey poolee wood; *Tam.* Koroockoy poolee maram. From Coimbatore.
1,677. Mimusops hexandra. *Eng.* Paula wood; *Tam.* Paulai maram; *Tel.* Paula kurra. From Masulipatam.
1,678. Odina wodier. *Eng.* Annaickarari wood; *Tam.* Annaickarai maram. From Coimbatore.
1,679. Phœnix sylvestris. *Eng.* Eetcha wood; Bengal Date tree; *Tam.* Eetcha maram; *Tel.* Eetcha chettoo. From Coimbatore.
1,680. Phyllanthus emblica. *Eng.* Nelly wood; *Tam.* Nellie maram; *Tel.* Woosareka kurra. From Coimbatore.
1,681. Prosopis spicigera. *Eng.* Purrumbay wood; *Tam.* Purambai maram. From Coimbatore.
1,682. Salvadora persica. *Eng.* Ugay wood; *Tam.* Ookari maram. From Coimbatore.
1,683. Sethia indica. *Eng.* Davadaree scented wood; *Tel.* Davadaree kurra, From Nuggar.
1,684. Shorea robusta. *Eng.* Saul. wood; *Tel.* Googilapa kurra. From Masulipatam.
1,685. Syzygium jambolanum. *Eng.* Roseapple tree; *Tel.* Neradoo kurra. From Kernool.
1,686. Tamarindus indica. *Eng.* Tamarind wood; *Tam.* Pooleya maram; *Tel.* Chinta kurra. From Coimbatore.
1,687. Tectona grandis. *Eng.* Teak wood; *Tam.* Take maram; *Tel.* Takoo kurra. From Coimbatore.
1,688. Terminalia glabra. *Eng.* Tella Muddy wood; *Tel.* Tella Muddy kerra. From Masulipatam.
1,689. Terminalia tomentosa. *Eng.* Nulla Muththee wood; *Tel.* Nulla Muththee kurra. From Masulipatam.
1,690. Ulmus integrifolia. *Eng.* Ayah wood; *Tam.* Ayah maram. From Coimbatore.
1,691. Wrightia antidysenterica. *Eng.* Veppaulai wood; *Tam.* Veppaulai maram.

20 Teak Saplings planted between the years 1844 and 1863, showing the stages of growth of this description of Timber. Obtained by A. Macgregor, Esq., from Malabar, at the instance of Major Beddome, Inspector of Forests, Madras Presidency.

"The finest teak plantation in the Madras Presidency, and indeed in all India, is the Conolly plantation on the River Bepur, in Malabar. It was formed by Mr. Conolly, the collector of Malabar, in 1844; and in 1862 Mr. Ferguson, the present superintendent, took charge. He continued to plant 100 acres a year. The plantations are on undulating ground, along both banks of the river, in a climate where the rainfall is 150 inches. They are in narrow belts extending for six miles, with a width from half a mile to a mile. The river is navigable to the sea, so that there are great facilities for the removal of timber. In planting new ground the jungle is felled and prepared for burning at the close of the dry season. Nurseries are formed in April. The seed is steeped in cold water for 48 hours, and sown on raised beds of fine mould covered with straw, to prevent too rapid evaporation, and constantly watered until the seeds germinate in 12 or 20 days. When the rains commence, the plants are put out in lines six feet apart, in pits a foot square and deep, filled with good surface mould. The ground is hoed and weeded from time to time, but after four years the young plantations keep down the grass and jungle by their own shade. Thinnings are made in the fifth year. The largest teak trees are now five feet in girth, with noble straight stems, without a branch for 60 or 70 feet. Up to 1865, the number of seedlings planted was 1,678,679, occupying 1,696 acres, and at the rate of 1,000 trees to an acre there are now about 1,800,000 trees. The yield in 1870–71 was 4,075 saplings floated to the depôt at Calicut, being the thinnings of the plantation, which more than repay the annual outlay."—"*The Moral and Material Progress and Condition of India,*" *by Clements R. Markham.*

14 Specimens of Woods from the Malabar District exhibited by A. Macgregor, Esq., Collector of Malabar.
1,692. Calophyllum angustifolium. *Eng.* Poon; *Tam.* Poona.
1,693. Calophyllum parviflorum. *Eng.* Kaka; *Tam.* Kaka Maram.
1,694. Artocarpus. *Eng.* Wild Jack Tree; *Tam.* Kattu Pilavoo.
1,695. Cedrela toona. *Eng.* White Cedar; *Tam.* Vellagila.
1,696. Soymida febrifuga. *Eng.* Red Cedar; *Tam.* Chukannikilu.
1,697. *Eng.* Wild Nutmeg; *Tam.* Cattoo Jathika.
1,698. *Eng.* Iyennee; *Tam.* Iyennee.
1,699. Pterocarpus marsupium. *Eng.* Vanga; *Tam.* Vanga.
1,700. *Eng.* Punda maram; *Tam.* Poonda maram.
1,701. Hopea parviflora. *Eng.* Eroombagum; *Tam.* Erroombagum.
1,702. Inga xylocarpa. *Eng.* Ervool; *Tam.* Erool.
1,703. Lagerstræmia reginæ. *Eng.* Benteak; *Tam.* Bentaikoo.
1,704. Dalbergia latifolia. *Eng.* Blackwood; *Tam.* Veetee.
1,795. Tectona grandis. *Eng.* Teak; *Tam.* Thaiku.
1,706. 62 specimens of woods from Coimbatore district, exhibited by A. Wedderburn, Esq., Collector of Coimbatore.

112 Specimens of Woods from the Neilgherry Hills, exhibited by J. R. Cockerell, Esq., Commissioner of the Neilgherries.
1,820. Amygdalus Persica. Introduced.
1,821. Mangifera Indica. Wood used for packing cases; fruit preserved and pickled, also used as a medicine; kernels ground and eaten by the poor; wood not durable. Up to 4,000 feet elevation.
1,822. Berberis Leschenaultiæ. From 6,000 to 8,000 feet elevation.
1,823. Michelia champaca. A good cabinet wood, very ornamental and beautifully mottled. 6,000–8,000 feet.
1,824. Syzygium Arnottianum. Wood generally dense and tough, excellent for loop of wheels, rollers, sugar cane and oil presses. 6,000 to 8,000 feet.
1,825. Cinnamomum, var. Wood, light, easily worked. 7–8,000 feet.
1,826. Name not known.
1,827. Randia, species. 4,000 feet.

1,828. Citrus. Wood close grained and tough; *good for engraving.* 3–5,000 feet.
1,829. Salix tetrasperma. Sea level up to 7,000 feet.
1,830. Celtis Roxburghii. 4,000 feet.
1,831. Name not known.
1,832. Ficus (species). 4,000 feet.
1,833. Terminalia tomentosa. One of our most valuable timbers; much used for house-building. Up to 3,500 feet.
1,834. Name not known.
1,834*a*. Name not known.
1,835. Phyllanthus emblica. Wood very hard and durable, stands water well, is used for gun stocks; colour reddish. Up to 3,000 feet.
1,836. Syzygium jambolanum. Wood hard, close grained, and tolerably durable; used for various purposes. Up to 4,000 feet.
1,837. Name not known.
1,838. Celastrus montanus. Wood hard and durable. 3,000 feet.
1,839. Terminalia chebula. Wood used for building of average quality. Up to 4,000 feet.
1,840. Cassia fistula. Heart wood, very strong and durable; used in ship-building, also for tom-toms and furniture. Up to 3,500 feet.
1,841. Bambusa arundinacea. The most useful and economical of all the vegetable products of the East. Up to 4,000 feet.
1,842. Name not known.
1,843. Ficus racemosa. Wood light and tough, coarse grained and brittle, durable in water; used for well rings, axle trees of carts, and panelling of doors. 4,000 feet.
1,844. Ricinus communis. Wood useless. Castor oil up to 5,000 feet.
1,845. Acrocarpus fraxinifolius. Up to 3,500 feet.
1,846. Olea dioica. Wood white, strong, compact, and useful. Up to 4,500 feet.
1,847. Dodonæa Burmaniana. Wood close grained, fine, startic, good for turning and for the engraver; used for walking sticks, tool handles, &c. Up to 8,000 feet.
1,848. Rhodomyrtus tomentosa. 6–7,000 feet.
1,849. Solenocarpus oblongus. Wood white, rough, and strong. 6–7,000 feet.
1,850. Sitsæa zeylanica. Wood very good, has strong smell of sweet briar when fresh cut. 4–6,000 feet.
1,851. Symplocos spicata. Wood perishable. 3–6,000 feet.
1,852. Hiptage madablota. 3–4,000 feet.
1,853. Carissa carandas. Useless except for firewood. Up to 4,000 feet.
1,854. Tectona grandis. The most valuable timber tree in India. Up to 3,000 feet.
1,855. Flacourtia insignis. Up to 4,000 feet.
1,856. Name not known.
1,857. Eleagnus. Up to 8,000 feet.
1,858. Gordonia obtusa. Wood, straw colour; used for building. 5–7,000 feet.
1,859. Sapota elengæoides. Wood strong, elastic, burns well when green. 5–7,000 feet.
1,860. Name not known.
1,861. Ilex Wightiana. Wood white like holly. 5–7,000 feet.
1,862. Michelia Niligirica. Wood straight and moderately close in grain. 6–7,000 feet.
1,863. Todalia aculeata. Up to 6,500 feet.
1,864. Name not known.
1,865. Berberis tinctoria. 6–8,000 feet.
1,866. Not known.
1,867. Phoberos crenatus. Wood very hard and heavy, light coloured, with small dark heart. Up to 4,000 feet.
1,868. Celastrus. Up to 4,000 feet.
1,869. Meliosma Arnottiana. Wood very light, striped. Up to 7,000 feet.
1,870. Not known.
1,871. Hydnocarpus alpinus. Wood much used for building, but liable to crack, splits well. 4–6,000 feet.
1,872. Vaccinium Leschenaultii. Wood very strong and good, raw coloured, with wavy grain. 6–8,000 feet.
1,873. Cleyera gymnanthera. Wood strong, and in great request for building purposes. 5–7,000 feet.
1,874. Olea polygama. Up to 5,000 feet.
1,875. Hedera rostrata. 4–6,500 feet.
1,876. Ixora parviflora. Wood used for torches, hard and close grained, and good for cabinet purposes. Up to 4,000 feet.
1,877. Pavetta. Up to 6,000 feet.
1,878. Machilus macrantha. Wood large and very useful for building purposes. Up to 7,000 feet.
1,879. Viburnum Wightiana. 6–8,000 feet.
1,880. Grumelia. 6–8,000 feet.
1,881. Not known.
1,882. Sethia Indica. Wood used as a substitute for sandal-wood in several parts of the Presidency. Up to 5,000 feet.
1,883. Cylicodaphne Wightiana. 4–6,000 feet.
1,884. Mesua Coromandelina. Up to 4–500 feet.
1,885. Not known.
1,886. Memecylon ramiflorum. Wood very tough; used for axles of carts. Up to 6,000 feet.
1,887. Cedrela toona. Up to 4,000 feet.
1,888. Bischoffia Rœperianus. Wood very hard; used for small spars. Up to 5,000 feet.
1,889. Sponia Wightii. Wood useless. Up to 5,000 feet.
1,890. Microchlæna quinquelocularis. Wood strong. Up to 4,000 feet.
1,891. Ficus religiosa. Wood light and useless, leaves used in tanning; a medicine. Up to 4,000 feet.
1,892. Litsæa oblonga. Up to 7,000 feet.
1,893. Manocera glandulifera 6–7,000 feet.
1,894. Carya Wightiana. Up to 8,000 feet.
1,895. Euonymus dichotomus. Wood close grained and hard. 5–7,000 feet.
1,896. Pomund (apple).
1,897. Pterocarpus marsupium. The very best wood for building next to teak; the best wood for railway sleepers in the Madras Presidency. Up to 4,000 feet.
1,898. Not known.
1,899. Cotoneaster buxifolia. 5–8,000 feet.
1,900–4. Not known.
1,905. Cinchona condaminea.

30 Specimens of Woods from Salem District, exhibited by C. T. Longley, Esq., Collector of Salem.

1,906. Hardwickia binata. Acha. Introduced.
1,907. Nauclea cordifolia. Munja kadambai. Introduced.
1,908. Nauclea parviflora. Nir kadambai. Introduced.
1,909. Albizzia lebbek. Vagai or Kat-a-va. Introduced.

1,910. Spondias mangifera. Kat-mam-maram. Introduced.
1,911. Canthium didymum. Neckany. Introduced.
1,912. Pterocarpus marsupium. Vangay. Introduced.
1,913. Cedrela toona. Sollee or Toon maram. Introduced.
1,914. Terminalia chebula. Karakai. Introduced.
1,915. Acacia sundra. Karingally. Introduced.
1,916. Conocarpus latifolia. Numma or Vella Nagay. Introduced.
1,917. Ailanthus malabaricus. Peemaram or Peru maram. Introduced.
1,918. Strychnos nux-vomica. Yetti kottay. Introduced.
1,919. Acacia arabica. Kurra-Valum. Introduced.
1,920. Erythroxylon areolatum. Davadari or Semblichan. Introduced.
1,921. Gyrocarpus Jacquinii. Thanakoo. Introduced.
1,922. Teak. Cât Thakoo-maram. Introduced.
1,923. Alangium Lamarkii. Allingee. Introduced.
1,924. Bischoffia Javanica. Sala. Introduced.
1,925. Diospyros cordifolia. Vuccana. Introduced.
1,926. Eugenia jambolana. Naga. Introduced.
1,927. Terminalia arjuna. Muddy. Introduced.
1,928. Santalum album. Chendanum. Introduced.
1,929. Albizzia odoratissima. Cât Thoorinjee Sella Woonga. Introduced.
1,930. Zizyphus jujuba. Yellenday. Introduced.
1,931. Ægle marmelos. Bilvarum. Introduced.
1,932. Vatica laccifera. Jalari. Introduced.
1,933. Mimusops elengi. Pogada. Introduced.
1,934. Stereospermum suaveolens. Pathare. Introduced.
1,935. Memecylon tinctorium. Allee or Hully. Introduced.

78 Specimens of Woods from the Madura District, exhibited by W. McQuhae, Esq., Collector of Madura.

1,936. Teak.
1,937. Thothagathi or Black wood.
1,938. Kungiliem.
1,939. Veckalley.
1,940. Vengai
1,941. Notchi.
1,942. Vaghey.
1,943. Velvela.
1,944. Marijanathi
1,945. Marnthoo.
1,946. Kormy.
1,947. Navel.
1,948. Karoovela.
1,949. Kaducoy.
1,950. Porasu.
1,951. Nettaloongi.
1,952. Kodyaul.
1,953. Kockatty.
1,954. Naratty.
1,955. Naikottah.
1,956. Poombatherai.
1,957. Pasali.
1,958. Kanooppaly.
1,959. Parambay.
1,960. Navoogu.
1,961. Vellooroony.
1,962. Authie.
1,963. Thain.
1,964. Pappela.
1,965. Oadoory.
1,966. Kooroonthu.
1,967. Thetha.
1,968. Vemboo.
1,969. Yettie.
1,970. Oosel.
1,971. Mammurrem.
1,972. Kollupotho.
1,973. Allingi.
1,974. Thanaku.
1,975. Valooky.
1,976. Veppalay.
1,977. Keluvay.
1,978. Penarie.
1,979. Oothia murrum.
1,980. Mullay Murungay.
1,981. Karoonthovaray.
1,982. Malay Vemboo.
1,983. Peytha.
1,984. Karoockuvatchi.
1,985. Vadathalay.
1,986. Koomilu.
1,987. Vackanathie.
1,988. Kulveeray.
1,989. Poolichi.
1,990. Kadamboo.
1,991. Semmana.
1,992. Oosa murrum.
1,993. Sembolagu.
1,994. Karungali.
1,995. Neerkadambai.
1,996. Vella Tovarai.
1,997. Eroongali.
1,998. Karoothali.
1,999. Munjackadembai.
2,000. Kustoory.
2,001. Thevatharem.
2,002. Sundana Vemboo.
2,003. Mathagirs Vemboo.
2,004. Kat Iluppai.
2,005. Odavela.
2,006. Pothacarava.
2,007. Nelli.
2,008. Miladum cooroonthu.
2,009. Vella or Wood-apple.
2,010. Pothoculli or Euphorbia.
2,011. Kat ilumitchai.
2,012. Malai uthi.
2,013. Uthi.

These specimens were so small as to be valueless.

21 Specimens of Woods from North Arcot, exhibited by H. E. Sullivan, Esq., Collector of North Arcot.

2,014. Pterocarpus santalinus.
2,015. Lawsonia alba.
2,016. Diospyros chloroxylon.
2,017. Terminalia chebula.
2,018. Nauclea cordifolia.
2,019. Casuarina equisetifolia.
2,020. Vatica laccifera.
2,021. Mimusops hexandra.
2,022. Zizyphus jujuba.
2,023. Syzygium jambolanum.
2,024. Acacia sundra.
2,025. Inga dulcis.
2,026. Pongamia glabra.
2,027. Mangifera Indica.
2,028. Ægle marmelos.

2,029. Gyrocarpus Asiaticus.
2,030. Santalum album.
2,031. Diospyros cordifolia.
2,032. Alangium lamarkii.
2,033. Cluytia collina.
2,034. Mimusops elengi.

6 Specimens of Wood from Cuddapah, exhibited by E. C. Plunkett, Esq., Conservator of Forests.

2,035. Pterocarpus santalinus. Erra Chendanam.
2,036. Shorea tumbagaia. Thumba.
2,037. Chloroxylon swietenia. Bellu.
2,038. Pterocarpus marsupium. Yegee.
2,039. Shorea laccifera. Jalari.
2,040. Nauclea parvifolia. Buta kavamee.

10 Specimens of Woods from Tinnevelly District, exhibited by G. K. Puckle, Esq., Collector of Tinnevelly.

2,041. Hardwickia pinnata.
2,042. Dipterocarpus sp.
2,043. Semecarpus auriculata.
2,044. Myristica.
2,045. Cynometra ramiflora.
2,046. Sterculia Heynii.
2,047. Podocarpus.
2,048. Not known. Shencooroongee maram.
2,049. Not known. Acha.
2,050. Not known.

85 Specimens of Woods from South Arcot, exhibited by H. W. Wooldridge, Esq., Conservator of Forests.

1,752. Tectona grandis. Teak, 2 specimens.
1,753. Hardwickia binata. Acha, 2 specimens.
1,754. Pterocarpus marsupium. Vengai, 2 specimens.
1,755. Dalbergia latifolia. Eroovady, 2 specimens.
1,756. Chloroxylon swietenia. Boosoo.
1,757. Acacia leucophlœa. Vel-valum.
1,758. Acacia sundra. Karungali, 2 specimens.
1,759. Diospyros melanoxylon. Karindoombi.
1,760. Acacia odoratissima. Saelai, 2 specimens.
1,761. Terminalia glabra. Kallee Marathey.
1,762. Terminalia chebula. Kadukah.
1,763. Nauclea cordifolia. Munji Kadembay.
1,764. Prosopis spicigera. Parambai.
1,765. Conocarpus latifolius. Nummai.
1,766. Acacia speciosa. Katvalai, 2 specimens.
1,767. Acacia elata. Kuttooranjee.
1,768. Shorea laccifera. Jalari, 2 specimens.
1,769. Terminalia Berryi. Vellay Marathey.
1,770. Tectona. Coshateak.
1,771. Briedelia montana? Colay Vengai.
1,772. Erul.
1,773. Sterculia guttata. Sen tanneken.
1,774. Sterculia urens. Vellatanneken.
1,775. Grewia tiliæfolia. Chadachey.
1,776. Cordia myxa. Corah.
1,777. Vateria Indica. Coongilium.
1,778. Strychnos potatorum. Taithan.
1,779. Woddea.
1,780. Cassia fistula. Vellaykoomey.
1,781. Ægle marmelos. Bilvamaram.
1,782. Bauhinia. Karin Katchan.
1,783. Strychnos nux-vomica. Yettey.
1,784. Diospyros. Karrey vukkang.
1,785. Sapindus emarginatus. Munny Poonjan.
1,786. Wrightia tinctoria. Chikkra palai.
1,787. Wrightia or Mimusops hexandra. Karry palai.
1,788. Alangium decapetalum. Arranji.
1,789. Bassia latifolia. Dhood Illupey.
1,790. Moringa. Val-morijah.
1,791. Acacia cinerea. Veddatarvey.
1,793. Sethia Indica. Chambalachan.
1,794. Mialardey.
1,795. Diospyros cordifolia. Velvukkany.
1,796. Acacia (species). Pelakatvalai.
1,797. Keerey.
1,798. Bassia longifolia. Kat Illupey.
1,799. Veerey.
1,800. Pavetta Indica. Pavetta.
1,801. Zizyphus jujuba. Yellendey.
1,802. Gmelina arborea? Coombadari.
1,803. Cedrela? Vanna Mahlee.
1,804. Semecarpus anacardium. Sharangeottai maram.
1,805. Melia azadirachta. Malla Vemboo.
1,806. Atalanta monophylla. Kalyelloomihan.
1,807. Cathartocarpus Roxburghii. Karrin Conney.
1,808. Nauclea parvifolia. Nir Kadembay.
1,809. Ægle marmelos. Kat Bilvaram.
1,810. Cratæva. Ponyeraley.
1,811. Pterospermum suberifolium. Velanjai.
1,812. Bauhinia tomentosa. Attey.
1,813. Stereospermum suaveolens. Padrey.
1,814. Poolavay.
1,815. Vellarrey.
1,816. Emblica officinalis. Nellimaram.
1,817. Terminalia belerica. Thaney.
1,818. Pongamia. Carody Poongen.
1,819. Cedrela species? Peykaraney.
1,707. Wrightia antedysenterica. Veppalay.
1,708. Poodunganarry.
1,709. Nekkaney.
1,710. Ficus racemosa. Uttey.
1,711. Mamkalum.
1,712. Morinda citrifolia. Nonah.
1,713. Acacia arabica. Karryvalum.
1,714. Soymida febrifuga. Sombi.
1,715. Cæsalpinia sappan. Vattangey.
1,716. Erumbilli.
1,717. Katwaingey.
1,718. Jalari.
1,719. Karingaly.
1,720. Acha.
1,721. Katvagai.
1,722. Pellykalturagai.
1,723. Velvalum
1,724. Somboorum.

20 Specimens of Mysore Woods, exhibited by Colonel Puckle.

3. Acacia odoratissima. Bilwár Mara. *Kanarese.*
4. Acacia arabica. Iáli Mara.
5. Terminalia alata. Matti Mara.
6. Acacia leucophlæa. Balagi Mara.
7. Acacia leucophlæa. Bili Iáli Mara.
8. Thespesia populnea. Portia Mara.
9. Canarium commune. Kagli Mara.
10. Acacia (sp). Banni Mara.
11. Lagerstræmia reginæ. Irulu Mara.
12. Stereospermum chelonoides. Genasu Mara.
13. Vatica laccifera. Jálada Mara.
14. Michelia champaka. Champaka Mara.
15. Cedrela Toona. Gandhagarighi Mara.

16. Vitex alata. Navaládi Mara.
17. Conocarpus latifolia. Dindlu or Dinduka Mara.
18. Soymida febrifuga. Sómé or Dinduka Mara.
19. Pterocarpus marsupium. Honne or Dinduka Mara.
20. Ficus glomerata. Atti or Dinduka Mara.
21. Melia Azedarach. Kádubévina or Dinduka Mara.
22. Nauclea cordifolia. Manja Kádambe.

35 Specimens of Mysore Woods, exhibited by the Mysore Local Committee.

23, 24. Bignonia falcata. Udi Mara.
25, 26. Calophyllum angustifolium. Kuve Mara.
27, 28. Azadirachta indica. Bévina Mara.
29, 30. Artocarpus hirsuta. Hebba Halasu Mara.
31, 32. Artocarpus integrifolia. Halasu Mara.
33, 34. Bassia longifolia. Hippe Mara.
35, 36. Cedrela toona. Gandhagarighi Mara.
37, 38. Chickrassia tabularis. Agilu Mara.
39, 40. Acacia speciosa. Bági Mara.
41, 42. Canarium commune. Kagli Mara.
43, 44. Tectona grandis. Tyágada Mara.
45, 46. Eugenia jambolana. Nérle Mara.
47, 48. Nauclea cordifolia. Bentak or Hettiga Mara.
49, 50. Myrobalan taria. Tári Mara.
51, 52. Lagerstræmia reginæ. Irupu Mara.
53, 54. Santalum album. Gandhada Mara.
55, 56. Inga xylocarpa. Jembe Mara.
57, 58. Soymida febrifuga. Súne Mara.
59, 60. Grewia asiatica. Tedasalu Mara.
61, 62. Ficus infectoria. Basali or Basari Mara.
63, 64. Hardwickia binata. Karáchi Kamarada or Asini Mara.
65, 66. Vitex alata. Navaládi Mara.
67, 68. Pterocarpus marsupium. Honne Mara.
69, 70. Diospyros melanoxylon. Maldi or Kari Mara.
71, 72. Lagerstræmia microcarpa. Nandi or Chellagadu Mara.
73, 74. Chuncoa muttia. Tore Matti.
75, 76. Cinnamomum iners. Dálchinni Mara.
77, 78. Terminalia tomentosa. Matti Mara.
79, 80. Terminalia coriacea. Karímattimara.
81, 82. Stereospermum chelonoides. Genasu Mara.
83, 84. Conocarpus latifolius. Dindiga Dindlu or Bejala Mara.
85. Calysaccion augustifolium. Sríhonné.
86. Cardia, sp. Hadaga Mara.
87. Ixora arborea. Goravi Mara.
88. Diospyros tupra. Tuparada Mara.

21 Specimens of Woods, exhibited by the Conservator of Forests, Berar.

4,333. Seemul. Bombax malabaricum.
4,334. Salai. Boswellia thurifera.
4,335. Amultas. Cathartocarpus fistula.
4,336. Amultas. Chloroxylon swietenia.
4,337. Jewus. Dalbergia oojeinensis.
4,338. Jaindoo. Diospyros melanoxylon.
4,339. Goollur. Ficus glomerata.
4,340. Bur. Ficus indica.
4,341. Peepul. Ficus religiosa.
4,342. Sewan. Gmelina arborea.
4,343. Dhamin. Grewia elastica.
4,344. Mendie Dhamin. Grewia latifolia.
4,345. Koorum. Nauclea cadamba.
4,346. Sadra. Pentaptera tomentosa.
4,347. Kowah. Pentaptera arjuna.
4,348. Beejasal. Pterocarpus marsupium.
4,349. Mokah. Schrebera swietenioides.
4,350. Roheen. Soymida febrifuga.
4,351. Kurai. Sterculiá urens.
4,352. Imlee. Tamarindus indica.
4,353. Sagwran. Tectona grandis.

A large collection of Woods from Bombay, without catalogue, and only numbered. Bombay Forest Department.

57 Specimens of Woods, exhibited by the Forest Department of the Central Provinces.

4,441. Kat Bel. Feronia elephantum. Used in house building, but is not very durable.
4,442. Ain. Mangifera indica. Wood, will not bear exposure. Weight about 42 lbs. to the cubic foot.
4,443. Gooler. Ficus glomerata. This wood is largely used for well frames. It resists decay while submerged, but is not durable as a building timber.
4,444. Bahera. Terminalia belerica. Coarse grained, attacked by insects. Of little value as a building timber.
4,445. Mohén. Odina wodier. Weighs 41 lbs. to the cubic foot, and is used for spokes of wheels and posts.
4,446. Lendya. Lagerstræmia parviflora. Capital wood for small buildings, and is much used in native houses.
4,447. Salai. Boswellia thurifera. Not durable; common boxes are made from it. Weight, 39 lbs. to the cubic foot.
4,448. Bél. Ægle marmelos. Very strong, adopted for naves of wheels and sugar crushers.
4,449. Toon. Cedrela toona. A valuable timber, not subject to warp. Is a favourite for cabinet work. Weight, 31 lbs. to the cubic foot.
4,450. Teak. Tectona grandis The most valuable Indian timber used in ship and house building. Weight, 47 lbs. per cubic foot.
4,451. Sheshum. Dalbergia latifolia. Is one of the rosewood of commerce, and is used extensively in cabinet work. Weight, 66 lbs. per cubic foot.
4,452. Anjan. Hardwickia binata. Strong and durable, used for railway sleepers and beams. Weight, 65 lbs. per cubic foot.
4,453. Rohau. Soymeda febrifuga. Subject to split by exposure, but does well for indoor beams. Weight, 66 lbs. to the foot.
4,454. Kussie. Briedelia montana. Strong, tough, and stands water well. Is a good durable wood.
4,455. Mowha. Bassia latifolia. Strong tough wood, but not much used. Is liable to the attacks of insects.
4,456. Sáj. Terminalia tomentosa. Strong heavy wood, makes capital beams and rafters. Weight, 50 lbs. to the cubic foot.
4,457. Babul. Acacia arabica. Very hard tough wood, employed for tent pegs, plough shares, and sugar cane rollers. Weight, 54 lbs. per foot.
4,458. Banyan. Ficus indica. A rather useless wood. The air drops are used for tent pegs and small masts.
4,459. Jamrassee. Elæodendron roxburghii. Good wood for cabinet making, but rather brittle. Weight, 40 lbs. to the foot.
4,460. Pallas. Butea frondosa. Used for posts and small building material.

4,440. Sal. Shorea robusta. First-class wood for beams, sleepers, or piles; is tolerably elastic, and resists the attacks of insects.

4,421. Padul. Stereospermum suaveolens. Small wood, fit for posts and furniture.

4,422. Semul. Bombax malabaricum. Soft useless wood; common boxes are made from it.

4,423. Banago. Heterophragma roxburghiana. Small building purposes; is tolerably durable.

4,424. Sewan. Gmelina arborea. Light wood, used for furniture and building purposes. Weight, 32 lbs. per foot.

4,425. Hewa. Acacia alba. Employed in agricultural and small building purposes. Weight, 45 lbs. per foot.

4,426. Sussora. Cordia myxa. Wood soft and of little use, except for fuel.

4,427. Tinsa. Dalbergia oojeinensis. A strong tough wood, but is attacked by insects; used for plough and cart building.

4,428. Hurra. Terminalia chebula. A hard heavy wood, employed for beams and rafters. Weight, 54 lbs. to the cubic foot.

4,429. Neem. Azadirachta indica. Small building and agricultural purposes.

4,430. Kaim. Nauclea parviflora. Used in furniture and house building. Weight, 35 lbs. per foot.

4,431. Cherinji. Buchanania latifolia. This wood is greatly used for posts and small building purposes.

4,432. Peepul. Ficus religiosa. A coarse timber, subject to attacks of white ants, and is not much used.

4,433. Koossum. Schleichera trijuga. Used for pestles of sugar and oil mills, spokes of wheels, and cotton presses.

4,434. Ghattool. Schrebera swietenoides. A close grained heavy and durable wood, not liable to warp or bend; used in making weavers, beams, &c.

4,435. Bhirra. Chloroxylon swietenia. Satin wood of commerce, valuable as a cabinet wood, but liable to warp and bend.

4,436. Ber. Zizyphus jujuba. Used in making agricultural implements.

4,437. Kaddam. Nauclea cadamba. Good for furniture and house building, but will not bear exposure.

4,438. Jamoon. Eugenia jambolana. Resists the effects of water well, and used for lining of wells.

4,439. Hurdoo. Nauclea cordifolia. A light and easily worked wood, close grained, and durable; will not bear damp or exposure, but is well suited for furniture and building work.

4,297. Beijasal. Pterocarpus marsupium. A coarse grained wood much used in building, good for beams and rafters. Weight, 56 lbs. per foot.

4,298. Karu. Uvaria tomentosa. A good durable wood, employed in building.

4,299. Amaltas. Cassia fistula. Employed in small buildings. Weight, 60 lbs. per foot.

4,300. Dhondera. Bauhinia parviflora. Used in agricultural implements and cart building.

4,301. Dhanino. Grewia elastica. One of the lance woods; good wood for shaft and spear handles. Weight, 64 lbs. per foot.

4,302. Kowah. Terminalia glabra. Capital wood for beams and rafters, and building purposes generally.

4,303. Tendú. Diospyros melanoxylon. One of the ebonies only employed in cabinet work.

4,304. Boja. Xylia dolalbriformis. Small wood used for making furniture.

4,305. Dhowra. Conocarpus latifolia. Greatly used in making ploughs and carts, and in house buildings as a rafter wood. Weight, 57 lbs. per foot.

4,306. Khair. Acacia catechu. Heavy, hard, and tough wood, but does not grow large; used for building purposes.

4,307. Sirris. Acacia speciosa. This is a good wood for beams, indoor work, and furniture. Weight, 56 lbs. per foot.

4,308. Imlie. Tamarindus indica. Used for sugar mills, oil presses, and naves of wheels. 50 lbs. to the cubic foot.

4,309. Tendu. Diospyros wightiana. One of the ebonies used in cabinet work.

4,310. Padri. Stereospermum chelonoides. A good durable wood, and well fitted for furniture.

4,311. Aonla. Emblica officinalis. This wood is valueless except for small building purposes.

4,312. Kindahi. Conocarpus myrtifolius. Used in building; very scarce. Weight, 59 lbs. to the foot.

4,313. Dobeyne. Acacia paniculata. Useless except for fuel.

20 Specimens of Woods from Gowalpara, exhibited by the Bengal Local Committee.

8,483. Shanalu wood.
8,484. Tentul or tamarind wood.
8,485. Jai wood.
8,486. Large dáwd kuru wood.
8,487. Iron-wood.
8,488. White karai.
8,489. Katal wood.
8,490. Katal bowla.
8,491. Malra dáod.
8,492. Sâl.
8,493. Kátali.
8,494. Ashai.
8,495. Gamari.
8,496. Bhatom moyna.
8,497. Jamá.
8,498. Jarowain.
8,499. Gownshoye.
8,500. Black karai.
8,501. Káoom.
8,502. Khashemala.

Eight Specimens of Himalayan Woods, exhibited by the Bengal Committee.

—	Native Name.	Scientific Name.	Altitude.	Forest.	Habitat.
8,427	Morinda	Picea webbiana	7,000–9,000	Jaunsar.	Himalaya.
8,428	Deodar	Cedrus deodara	7,000–9,000		
8,429	Rai	Abies smithiana	7,000–9,000		
8,430	Chir	Pinus longifolia	4,000–6,000		
8,431	Chil	Pinus excelsa	6,500–8,500		
8,432	Inai	Quercus inai	7,000–9,000		
8,433	Moru	Quercus dilatata	6,000–8,000		
8,434	Banj	Quercus incana	5,000–7,000		

Timbers from Oude.

—	Botanical Name.	Use.	Price in India.
			Per cubic foot.
No. 1 F.	Conocarpus latifolius.	Cart axles - -	4*d.*
No. 2 F.	Diospyros tomentosa.	Furniture, boxes, &c.	1*s.* 6*d.*
No. 3 F.	Nauclea cordifolia	Door panels, boxes, combs, &c.	8*d.*
No. 4 F.	Terminalia chebula.	Fruit used medicinally, wood poor.	4*d.*
No. 5 F.	Cedrela toona -	For boxes and light framing.	10*d.*
No. 6 F.	Acacia elata -	Firewood and native houses.	4*d.*
No. 7 F.	Ougeinia dalbergioides.	Cart wheels - -	10*d.*
No. 8 F.	Mangifera indica	For buildings, fruit eatable.	6*d.*
No. 9 F.	Pinus longifolia -	For boxes and buildings.	6*d.*
No. 10 F.	Holopetala integrifolia.	Building native houses.	3*d.*
No. 11 F.	Nauclea parvifolia	Door panels, boxes, and combs.	3*d.*
No. 12 F.	Holarrhena antidysenterica.	*Seeds* antidysenteric	Wood worthless

No list sent of these, and the above are all out of a large collection, on which name or number could be deciphered. Damaged by water.

112 Specimens of Woods procurable in Pegu and Tenasserim, exhibited by W. Theobald Esq., of the Geological Survey of India.

(Good Sleeper woods marked thus *.)

9,009. *Pudouk. Pterocarpus dalbergioides, *Roxb.* This wood is much used in the gun carriage manufactories in India, and for general coach building. It is a large tree, easily raised from seed, and used as an ornamental tree alongside the roads of Rangoon. The wood is strong, durable, and handsome, and when freshly cut very fragrant.

9,010. *Pyngudo. Inga xylocarpa, *De Can.* A tree of the largest size. Wood in universal use where strength is required and weight no objection. Wood very hard, heavy, and lasting, and procurable of any scantling.

9,011. *Engyeng. A sacred tree of medium size, never used by the Burmese except in their sacred buildings. The wood is excellent, hard, tough, and lasting, with the general appearance of Sahl (Sâl).

9,012. *Kewn. Tectona grandis, *L.* Teak. Too well known to require comment. Common.

9,013. *Shah. Acacia catechu, *L.* A tree of medium size, but growing large under favourable conditions. Wood hard, imperishable, but very fissile. This tree germinates from seed with the utmost facility, is of rapid growth, and from its growing in dry situations (though dwarfed thereby) is indicated as well suited for planting on embankments. As a fuel it is excellent. Common.

9,013*a*. *Thiwyn. A medium-sized tree. Wood dark coloured, much resembling the next, but more handsomely mottled; it is both hard and tough, and is well adapted for ornamental work no less than for all purposes requiring great toughness and strength. Common.

9,014. *Yyndeik. Dalbergia. A tree of the largest size, common in Pegu. It is closely allied to the tree yielding the "Blackwood" of Bombay. Heart wood small in proportion to the size of the tree. Hard, tough, and imperishable. Would yield admirable sleepers.

9,015. *Touk-Kyahn. Terminalia macrocarpa, *Brandis.* A tree of the largest size, and of handsome appearance. Timber seems hard and strong (but is condemned by some), and of any scantling. It is probably a wood that requires thorough seasoning to last.

9,016. Pyingmah, or Pimah. Lagerstræmia reginæ, *Roxb.* A tree of medium size, but in the Sandoway district and other favourable situations, growing to twenty feet in girth. Wood much used and esteemed for general purposes.

9,017. Eng. Dipterocarpus grandiflora, *Wall.* One of the many "wood oil trees" of Pegu. A tree of the largest size. Wood decays when exposed, but is more durable for inside work and is procurable of any scantling.

9,018. Thykudo. Cedrela toona, *Roxb.* (or a closely allied species). Rather local in Pegu. A light, fragrant wood suited for any purpose for which "cedar" is used, but is subject to decay and attacks of insects.

9,019. *Thiyah. Shorea robusta, *Wall.* A large tree yielding an excellent though rather cross-grained timber.

9,020. *Nubbhay. Odina wodier. A medium-sized tree, common in Pegu, and much used. Timber good, but almost impossible to season thoroughly, so retentive is it of sap. Seems a good furniture and ornamental wood.

9,021. *Hpahngah. Terminalia chebula, *Roxb.* A large tree common in Pegu. Wood very hard, tough, and lasting, and though not much used, is one of our most valuable woods. Heart-wood, dark-brown. Sap wood, pale yellowish, but in old trees not very inferior to the darker heart.

9,022. Touk Shah. Vitex leucoxylon, *Roxb.* A very large handsome tree. Wood not very strong, but obtainable of any scantling.

9,023. Ouchynzah. Diospyros ehretioides. Rare and local in Pegu.

9,024. Munyokhah. Carallia integerrima, *De Can.* A tree of the largest size. Wood open grained and of little value, but used for planking and very largely for rice pounders, or husking mortars, one of which is found in almost every Burmese house.

9,025. Peinay. Artocarpus integrifolia. A handsome wood for furniture.

9,026. Myouk-goung. A large tree, not common, yields a good yellow wood well adapted for furniture.

9,027. Tein. Nauclea parviflora, *Roxb.* A medium sized tree, rather common, and seems a good wood. This and some other species of Nauclea are esteemed for fuel and cut for that purpose,

9,028. Byngah. Nauclea diversifolia, *Wall.*

9,029. Paywoon. Berrya mollis. A small tree not uncommon, wood handsome and much esteemed.

9,030. Pet-thahn. Spathodea stipulata, *Wall.* A small tree not common. Wood hard, tough, and much esteemed.

9,031. Kyet-yo. Vitex alata. A medium sized tree nowhere common. Wood very hard and durable.

9,032. Bhumor. A small tree.

9,033. *Thyngahn-net. Hopea odorata. A large tree, now becoming scarce in Pegu. The wood of this tree is more highly esteemed for boats than any other. It is white when freshly cut, but turns dark brown by exposure.

9,034. *Koake. Albizzia. A large tree. Wood highly prized by the Burmese.
9,035. Kewn-bo. A medium sized tree. Wood much used along the Arakan coast.
9,036. *Pallen. Casuarina muricata, *Roxb.* Common on the Coast. Wood strong but not used.
9,037. Zymbewn. Dillenia aurea. Middle sized tree. Wood used for house posts.
9,038. Kunyoung.
9,039. Naji. Pterospermum lancifolium. Tree small. Wood light, might do for fancy work.
9,040. Thullay.
9,041. Olea dioica, *Roxb.*
9,042. *Gahngor. Mesua ferrea, *L.* A middle sized tree occasionally growing to a large size. Wood hard, strong, and imperishable, but coarse and hard to work up. Equal to any wood for sleepers and rough work.
9,043. Schima oblata.
9,044. Kashyt.
9,045. Tur-hpi. Calophyllum longifolium. A large tall tree. Yields the true "Poon spars" of commerce. Common on the Arakan coast.
9,046. Poanyet. Calophyllum inophyllum, *L.* A tree very common along the coast, of a much stronger and less elevated habit of growth than the last. The wood of these two species is, however, quite undistinguishable, and seems worth attention as a soft wood where no great strength is required.
9,047. Kyanah. A red and pretty common wood in the Bassein district. This wood much resembles mahogany, but has probably less strength. It works up well and is little liable to either warp or crack. It is very deserving of attention.
9,048. Hpalawah. A small tree not common. Wood much esteemed.
9,049. Hmah-chouk.
9,050. Hnor. Nauclea cordifolia, *Roxb.*
9,051. Peinay-bo. Not common.
9,052. Thytsi-bo. Scarce. Appears to be a good wood and not liable to crack.
9,053. Toung ben. Artocarpus mollis. A tree of the largest size, much used for making boats.
9,054. Thyngahn-wah. "Red Thyngahn." Almost equally esteemed with "Black Thyngahn."
9,055. Themyn. Podocarpus neriifolia. A small piece of this wood is inserted into the stem of a new boat to guard against ill luck and witchcraft.
9,056. Choundouk.
9,057. Kunabyo. Several trees are called by this name, and among them is the "Soondri" of Bengal, the toughest wood in India.
9,058. ? An admirable wood of Bassein district.
9,059. Yay bimah.
9,060. Thanoung. Acacia suma.
9,061. Muji. Tamarindus indica. The purple heart wood is the heaviest wood known to me in India. It is a regular lignum vitæ in its characters.
9,062. Mah-oo-kudoon. Nauclea cadamba, *Wall.* Recommended by some, but sadly liable to the depredations of insects.
9,063. Thymmaji. Albizzia odoratissima. A large tree, yielding a handsome and excellent wood.
9,064. Jeudi. Quercus Amherstiana. Tolerably common. Wood not much used.
9,065. Syt. Albizzia elata. A large tree, very common. Wood very open in grain, but rather esteemed.
9,066. Kathyt. Erythrina avalifolia. Not used in Burmah, but made into scabbards for swords in India.
9,067. *Pyanahn. Carapa obovata. Tree common on the coast. Wood esteemed for strength.
9,068. *Yimah. Chickrassia tabularis, *Juss.* Wood in some esteem. One of the Chittagong "red woods."
9,069. Jay. Diospyros. The Burmese "Jay" has little or no black heart wood; it is not used.
9,070. *Pynlayoang. Xylocarpus granatum. Wood esteemed for house posts. Common on the sea board.
9,071. Ngoo Shooay. Cathartocarpus fistula, *L.* Tree of small size and scarce, but wood regarded as equal in strength and durability to Pyngudo, No. 2.
9,072. Yemmunen. Xanthoxylon budrunga. A very inferior wood.
9,073. Yoang. Conocarpus acuminatus. A tree of large size. Wood said to be strong, but liable to the attacks of insects.
9,074. Myouk nudoung. Cassia auriculata, *Wall.*
9,075. Seitkhi-hpalahn. Briedelia. Wood esteemed for house posts.
9,076. Joak. Diospyros cordifolia.
9,077. Thylydar. Spathodea. An inferior wood.
9,078. Koung-gruk. An inferior wood.
9,079. Thykkah. A soft red wood much used about Rangoon.
9,080. Thukoot-hpoo. Stereospermum chelenoides. A coarse strong wood of large scantlings, but very subject to the attack of insects.
9,081. Toungthulay. Garcinia cowa. A light wood used for paddles.
9,082. Thumay. A soft wood of the coast, with interlacing fibres, used for rice mortars.
9,083. *Gio. Schleichera trijuga, *Wall.* An excellent hard, heavy, and strong wood of medium scantling, highly esteemed for strength and durability; not common.
9,084. ?
9,085. Thytsi. Melanorrhœa usitatissima, *Wall.* The black varnish tree common in Pegu. The wood is very handsome and durable, but of middling scantling. This common wood deserves notice.
9,086. Bewben. Dillenia pentagyna. A strong useful wood.
9,087. Kuteyn.
9,088. Kumlah. Very poor wood.
Kiten. (Missing.) A heavy wood used for posts and rice mortars, but extremely fissile.
9,090. May-tay-o. A wood of Tavoy. Seems inferior.
9,091. *Ahnahr. Fagræa fragrans. A large tree of Martaban, yielding an excellent and imperishable timber.
9,092. Sooaydor (?). Amoora Rohituka. The real Sooaydor is a very hard box-like wood.
9,093. Mudamah. A small tree of the seaboard. This wood though of small scantling is highly prized for house posts, for its strength and durability.
9,094. Baybyah. Said to be indentical with Anahmbo.
9,095. *Sowyo. Walsura robusta. A strong wood much prized for tool handles.

9,096 and 9,097 ?
9,099. Kuzi.
9,100. Yeway-gi. Adenanthera pavonina.
9,101. Kulloway. Cinnamomum obtusifolium.
9,102. Gingbaht.
9,103. Thumein upew (or bew). Gardenia sessiflora.
9,104. Bushew. Mimusops indica. A bad specimen of this admirable wood. It grows very extensively in the Andamans and seems an admirable sleeper wood equal to pyngudo No. 2, rare in Pegu.
9,105. Pahnthugah. A wood of Martaban.
9,106. Kyetmouk. Euphoria longana. A fruit tree of Martaban; wood indifferent.
9,107. Toungmuji. Elœocarpus floribundus.
9,108. Thyt-ni.
9,109. Yengaht. Gardenia coronaria.
9,110.
9,111. Thahngyah.
9,112. Bananen. A Martaban wood.
9,113. *Kayzay. A Martaban wood.
9,114. Thyt-to
9,115. Toungthalay. A Martaban wood. The same name as No. 79, but seems a different wood.
9,116. Nay-u-ay. A Tavoy wood.
9,117. Kyu-zoa-ay-kayo. A Tavoy wood.
9,118. Touktoo-yay. A Tavoy wood.
9,119. Shahm-pei-oak. A Tavoy wood.
9,120. Mahta-lay. A Tavoy wood.
9,121. *Toung-ganhgor. A very hard, heavy, and imperishable wood of Tavoy, deserving to be better known.

134 Specimens of Indian Woods from Indian Museum, London.

1. Acacia arabica.
2. Acacia catechu.
3. Acacia diluta.
4. Acacia julibrissin.
5. Acacia leucophlæa.
6. Acacia marginata.
7. Acacia spinosa.
8. Acacia sundra.
9. Acacia tomentosa.
10. Acacia sp.
11. Acer oblongum.
12. Acrocarpus fraxinifolius.
13. Actephila neilgherrensis.
14. Adenanthera pavonina.
15. Ægle marmelos.
16. Agati grandiflora.
17. Aglaia midnaporensis.
18. Ailanthus excelsa.
19, 20, 21. Albizzia lebbek.
22, 23. Albizzia odoratissima.
24, 25, 26. Albizzia procera.
27. Albizzia stipulata.
28. Albizzia sp.
29. Alstonia macrophylla.
30. Alstonia scholaris.
31. Amygdalus communis.
32. Anacardium occidentale.
33. Ancestrolobus carnea.
34. Andrachne trifoliata.
35. Antidesma diandrum.
36. Areca catechu.
37. Artocarpus chaplasha.
38. Artocarpus echinata.
39. Artocarpus hirsuta.
40. Artocarpus integrifolia.
41. Artocarpus lakoocha.
42. Artocarpus mollis.
43. Artocarpus polyphema.
44. Artocarpus sp. (Champada. Penang.)
45. Averrhoa carambola.
46. Azadirachta indica.
47. Barringtonia sp.
48. Bassia latifolia.
49. Bassia longifolia.
50. Bauhinia malabarica.
51, 52. Bauhinia racemosa.
53, 54. Bauhinia variegata.
55. Berrya ammonilla.
56. Berrya mollis.
57. Betula sp.
58. Bischoffia javanica.
59 Blighia sapida.
60. Bombax malabaricum.
61. Bombax sp.
62. Borassus flabelliformis.
63. Boswellia serrata.
64. Briedelia berryana.
65. Briedelia retusa.
66. Briedelia sp.
67. Briedelia stipularis.
68. Buchanania latifolia.
69. Butea frondosa.
70. Buxus sempervirens.
71. Byttneria sp.
72. Cæsalpinia sappan.
73. Callicarpa arborea.
74, 75. Calophyllum bracteatum.
76. Calophyllum sp.
77. Calosanthes indica.
78. Calyptranthes sp.
79. Calysaccion longifolium.
80. Cambessedea oppositifolia.
81. Canarium bengalense.
82. Canarium commune.
83. Carallia integerrima.
84. Carallia lucida.
85. Careya arborea.
86. Casearia? pentandra.
87, 88. Cassia fistula.
89. Cassia florida.
90. Cassia roxburghii.
91. Castanea indica.
92. Castanea sp.
93. Casuarina.
94. Casuarina muricata.
95. Cedrela toona.
96. Celtis roxburghii.
97. Tacar (*Chelonia*).
98. Chickrassia tabularis.
99. Chloroxylon swietenia.
100. Cinnamomum iners.
101. Cinnamomum parthenoxylon.
102. Citrus decumana.
103. Cleidion javanicum.
104. Cocos nucifera.
105. Combretum trifoliatum.
106. Conocarpus acuminatus.
107. Conocarpus latifolius.
108. Conocarpus myrtifolius.
109. Conocarpus sp.
110. Cordia angustifolia.
111. Cordia latifolia.
112. Cordia macleodii.
113. Cordia myxa.

114. Cordia sp.
115. Cupressus funebris.
116. Cupressus sempervirens.
117. Cupressus torulosa.
118. Cynometra polyandra.
119. Cynometra ramiflora.
120. Dalbergia alata.
121, 122, 123, 124. Dalbergia lanceolaria.
125. Dalbergia latifolia.
126. Dalbergia oojeinensis.
127. Dalbergia ovata.
128. Dalbergia sissoides.
129. Dalbergia sissoo.
130. Fagræa fragrans.
131. Heterophragma chelonoides.
132. Homalium tomentosum.
133. Spathodea stipulata.
134. Vateria indica.

B.—TANNING BARKS AND DYE-WOODS.

Materials employed for tanning leather in the Government factory, exhibited by the Commissary of Ordnance, Cawnpore.

1. Divi-divi. Cæsalpinia coriaria.
2. Myrabolans. Terminalia chebula.
3. Myrabolans, broken up. Do.
4. Babool bark. Acacia arabica.
5. Babool bark, crushed.
6. Shumac.

Bark exhibited by H. W. Wooldridge.

1,725. Valum bark.
1,726. Avarum bark.

Forest products for tanning, &c., exhibited by the Mysore Local Committee.

94. Myrabolans. Terminalia chebula.
101. Morinda bark. Morinda umbellata.
103. Logwood. Hæmatoxylon campechianum.
110. Babool bark. Acacia arabica.
112. Red sanders. Pterocarpus santalinus.
1,586. Bark of Cassia auriculata. Dr. G. Bidie. Madras.

Forest products for tanning and dyeing from India Museum, London.

2,993. Babool bark. Acacia arabica.
3,020. Sapan wood. Cæsalpinia sappan.
3,026*a*. Cassia bark. Cassia fistula.
3,043. Logwood. Hæmatoxylon campechianum.
3,063. Bark of Myrica sapida.
3,070. Aomla. Phyllanthus emblica.
3,072. Galls of Pistacia vera.
3,077. Oak gulls. Quercus infectoria.
3,078. Quercitron bark. Quercus tinctoria.
3,083. Mangrove bark. Rhizophora mucronata.
3,084. Tengah bark. Rhizophora sp.
3,093. Lodh bark. Symplocos racemosa.
3,103. Bedda nuts. Terminalia belerica.
3,104. Myrabolans. Terminalia chebula.

C.—GUMS AND RESINS.

These products have as yet not been fairly and completely sought out and developed in India. The supply could doubtless be very large, but so long as indiscriminate mixing and careless collection is the rule rather than the exception, the gums and resins of Indian forests will fail to secure a remunerative market. Under this sub-section four minor subdivisions might be established, under which all the varieties could be grouped. These would be,—

1. Gums.
2. Resins.
3. Oleo-resins.
4. Elastics and guttas.

The first subdivision would include all gums wholly or partially soluble in water, whether of the Arabic or Tragacanth kind. The second would include resins more or less soluble in alcohol, such as copals, mastics, and gum resins such as asafœtida and ammoniacum. The third would include turpentine, wood-oil, and balsams. The fourth and last division would contain india-rubber and gutta percha, with substances of a similar character.

In the present catalogue the products are classed according to exhibitors, and have not been grouped under the foregoing subdivisions, the collection being by no means representative, and too small to deal with under the proposed grouping.

9 Gums from Madras, exhibited by Dr. G. Bidie, Madras.

1,582. Gamboge. Garcinia pictoria.
1,590. Piney. Vateria indica.
1,591. Olibanum. Boswellia sp.
1,594. Black Dammar. Canarium strictum.
1,595. Babool. Acacia arabica.
1,596. Neem gum. Azadirachta indica.
1,597. Mastic. Pistacia lentiscus.
1,598. Benzoin. Styrax benzoin.
1,599. Bdellium. Balsamodendron sp.

2 Dammars from Salem.

2,114. White dammar.
2,115. Black dammar.

22 Gums from the Salem District, exhibited by C. T. Longley, Esq., Collector of Salem.

2,064. Acha. Hardwickia pinnata.
2,065. Vellam. Feronia elephantum.
2,066. Vengay. Pterocarpus marsupium.
2,067. Vapum. Melia azadirachta.
2,068. Sella Woonga or Kul Thooningee. Albizzia odoratissima.
2,069. Moorkum.
2,070. Vagai or Kat-a-va. Albizzia lebbek.
2,071. Kat Elevam. Eriodendron anfractuosum.
2,072. Numdalai.
2,073. Parabay. Prosopis spicigera.
2,074. Dupada. Vateria indica.
2,075. Nelli Kai. Emblica officinalis.
2,076. Kendallai.
2,077. Broshoo or Pooroosoo. Chloroxylon swietenia.
2,078. Sarang-kottay. Semecarpus anacardium.

2,079. Numma or Vellay Naga. Conocarpus latifolius.
2,080. Pee or Peru gonthoo. Ailanthus malabaricus.
2,081. Kara valum. Acacia arabica.
2,082. Vel-Valum. Acacia leucophlœa.
2,083. Mullay vamboo. Melia azadirachta.
2,084. Sala. Bischoffia javanica.
2,085. Pullia. Tamarindus indica.

15 Gums from the Coimbatore District, exhibited by A. Wedderburn, Esq., Collector of Coimbatore.

2,086. Wood-apple gum.
2,087. Caroovelam gum.
2,088. Cattoomuroonga gum.
2,089. Veeramaram gum.
2,090. Thoombaramaram gum.
2,091. Navalamaram gum.
2,092. Oonjaimaram gum.
2,093. Coongoomaram gum.
2,094. Porasomaram gum.
2,095. Namamaram gum.
2,096. Woonjaimaram gum.
2,097. Congoomarum gum.
2,098. Poorasamaram gum.
2,099. Nanamaram gum.

13 gums from Madura district, exhibited by W. McQuhae, Esq., Collector of Madura.

2,051. Vaghey. Acacia speciosa.
2,052. Valvela.
2,053. Puyoolagoo.
2,054. Porasu. Thespesia populnea.
2,055. Vemboo. Chickrassia tabularis.
2,056. Mooroongay.
2,057. Vengai. Pterocarpus marsupium.
2,058. Black Kungilium.
2,059. White Kungilium.
2,060. Veckale. Conocarpus latifolius.
2,061. Karoovela.
2,062. Mango. Mangifera indica.
2,063. Vela or wood apple. Feronia elephantum.

9 gums from the Central Provinces, exhibited by the Forest Department.

4,314. Gond Pallas. Butea frondosa. An astringent gum employed in dyeing red; dissolves in water.
4,315. Gond Cheronji. Buchanania latifolia. Not utilized in these provinces.
4,316. Gond Salai. Boswellia thurifera. Burnt as incense in native temples. A description of olibanum.
4,317. Gond Dhowra. Conocarpus latifolius. A kind of gum Arabic.
4,318. Gond Dikamalli. Gardenia lucida. Applied medicinally to sores and wounds to keep flies off.
4,319. Gond Babul. Acacia arabica. Employed in native confectionery.
4,320. Gond Khurroo. Sterculia urens. Used as a substitute for tragacanth.
4,321. Gond Katta. Acacia catechu. The catechu of commerce.
4,322. Gond Rál. Shorea robusta. Used in the marine yards of Bombay as a "Dammer."

Gums from Indore, exhibited by the Local Committee.

843. Gum of Peepul.
868. Gum of Kuthlia.
869. Kamarcus gum.
870. Babool gum. Acacia arabica.
873. Khair gum. Acacia catechu.

6 Gums from Berar.

4,360. Babool. Acacia arabica.
4,361. Dowra. Conocarpus latifolius.
4,362. Char. Buchanania latifolia.
4,363. Kurai. Sterculia urens.
4,364. Sadra. Pentaptera tomentosa.
4,365. Salia. Boswellia thurifera (?).

Gums exhibited by the Bombay Local Committee.

5,234. Habk Hadie, from Aden.
5,233. Frankincense, from Aden.
5,232. Frankincense, from Aden.
5,231. Mastic gum, from Aden.
5,230. Gum, from Aden.
5,229. Myrrh, from Aden.
7,290. Asafœtida, from Nassick.

The Bombay lists were so imperfect that it was impossible to identify many of the articles sent under the different sections.

31 Gums and resins from Amritsur Local Committee.

3,498. Sal Resin. Shorea robusta. Amritsur.

The specimens were so small as be valueless.

Four Specimens from Burmah.

8,930. Juice of Ficus elastica.
8,916. Gamboge.
8,928. Resin of Hopea odorata.
8,927. Resin of Dipterocarpus grandiflora.

31 Specimens exhibited from the India Museum, London.

2,811. Gum Arabic. Acacia arabica.
2,812. Kheir gum. Acacia catechu.
2,822. Mutti pal. Ailanthus malabarica.
2,828. Myrrh. Balsamodendron myrrha.
2,829. Bdellium. Balsamodendron roxburghii.
2,836. Arabian olibanum. Boswellia Bhau-dagiana?
2,839. Cheronjie gum. Buchanania latifolia.
2,840. Butea Kino. Butea frondosa.
2,846. Black dammar. Canarium strictum.
2,854. Kuteera gum. Cochlospermum gossypium.
2,856. Gum of Conocarpus latifolius.
2,859. Dammar. Dammara orientalis.
2,861. Gum ammoniacum. Dorema ammoniacum.
2,871. Gamboge. Garcinia morella.
2,873. Mysore Gamboge. Garcinia pictoria.
2,874. Dikamali resin. Gardenia gummifera.
2,878. Dhawa gum. Grislea tomentosa.
2,880. Resin of Hopea odorata.
2,880*a*. Resin of Hopea parviflora.
2,885. Gum of Macaranga tomentosa.
2,894. Asafœtida. Narthex asafœtida.
2,895. Wodier gum. Odina wodier.
2,897. Gum sarcocolla. Pencea mucronata.
2,907. Gum kino. Pterocarpus marsupium.
2,913. Saul tree gum. Shorea robusta (resin).
2,915. Kuteera. Sterculia urens.

2,917. Benzoin. Styrax benzoin.
2,923. Mungachi. Terminalia angustifolia.
2,925*a*. Banapu. Terminalia tomentosa.
2,925*c*. Gum animi (garbled). Trachylobium mozambicense.
2,927. Gum piney. Vateria indica.

SECTION IV.—HORTICULTURE.

The exhibits under this group are very few, consisting of a small collection of plants used as potherbs, and a collection of horticultural seeds. A few additional nuts and dried fruits are placed here for convenience instead of dividing them between this section and section 3, and group IV.

Plants used as potherbs, from Gowalpara, exhibited by the Bengal Committee.

7,870, 469. Meti.
7,871, 470. Halim.
7,872, 471. Chuka.
7,873, 472. Palong.
7,874, 473. Goleelall.
7,875, 474. Matar gach.
7,876, 475. Boro bothooa.
7,877, 476. Gua mouri.
7,878, 477. Rai soro.
7,879, 478. Peringa.
7,880, 479. Babooree.
7,881, 480. Poodena.
7,882, 481. Choto bothooa.
7,883, 482. Radhuni.
7,884, 483. Salaj.
7,885, 484. Lál ság.
7,886, 485. Posta.
7,887, 486. Indigo plant.
7,888, 487. Koosum.

Collection of Horticultural Seeds, exhibited by Mr. V. Fretwell, Khandeish.

7,251. Adga seed.
7,252. Popaya seed.
7,253. Jungle Bor.
7,254. Cultivated Bor.
7,255. Shitaphul seed.
7,256. "Seoga" seed.
7,257. "Karlee" seed.
7,258. "Binjal" seed.
7,259. "Bhenda" seed.
7,260. "Abai" seed.
7,261. "Val" seed.
7,262. "Gowar" seed.
7,263. "Turbooj" seed.
7,264. "Cucumber" seed.
7,265. "Kurbooj" seed.
7,266. "Toorai" seed.
7,267. "Chakrie" seed.
7,268. "Gungaphul" seed.
7,269. "Gelki" seed.
7,270. "Sunflower" seed.

Edible Nuts and Dried Fruits.

7,274. Walnuts. From Aden. Bombay Committee.
7,277. Almonds. From Aden. Bombay Committee.
7,279. Almonds. From H.H. the Guickwar of Baroda.
7,280. Dried grapes. From H.H. the Giuckwar of Baroda.
7,282. Mika. From H.H. the Guickwar of Baroda.
1,532. Country almond. Terminalia catappa. Madras.
8,804. Country almond. Terminalia catappa. Bengal.
2,356. Country almond. Terminalia catappa. India Museum.
2,313. Cashew. Anacardium occidentale. India Museum.
1,533. Cashew. Anacardium occidentale. Madras.
2,338. Tamara. Nelumbium speciosum. India Museum.
400. Tamara. Nelumbium speciosum. Madras.
2,358. Singhara. Trapa bispinosa. India Museum.
7,281. Dried mowha. Bassia latifolia. Baroda.
992. Dried mowha. Bassia latifolia. Nagpur.
3,755, 3,754. Dried mowha. Bassia latifolia. N. W. Provinces.

These are the dried fleshy calyces of the flowers resembling raisins in appearance and taste. From them the Mowha spirit is distilled.

7,849. Tamarinds. Bengal.
7,848, 7,853. Dried mango. Bengal.

GROUP III.—CHEMICAL INDUSTRY.

SECTION I.—CHEMICAL PRODUCTS FOR TECHNICAL PURPOSES.

GOVERNMENT GUNPOWDER FACTORY, MADRAS.

Samples of refined and unrefined saltpetre.

Eight samples of salt manufactured in the Nellore district. Exhibited by C. E. Plunkett.

Specimens of soda and a kind of salt from Aden. Exhibited by Bombay Committee.

AMRITSAR LOCAL COMMITTEE.

8,759. Specimen of Sohágá (borax).

Sohágá, or *borax*, is also called tincal. It is obtained in large quantities in the valley of Pega, in Ladakh, and in Thibet; it is collected on the borders of the lakes as the water dries up, then smeared with fat to prevent loss by evaporation, and transported across the Himalayas on the backs of sheep and goats; refined at Umritsur and Lahore by washing with lime water. It is employed by the natives as a tonic for loss of appetite; also as a deobstruent and diuretic in ascites; and also to promote labour. It is used in the arts to clean metals before soldering, to form a glaze on earthenware, and in the preparation of varnishes. It is employed as a chemical flux in experiments with the blowpipe. It is in composition a biborate of soda. Price of raw borax, 4*d.* per lb.; of refined borax, 6*d.* per lb.

Specimen of Hartal (orpiment or sulphide of arsenic).

Arsenical preparations enter largely into the composition of the native drugs; they are used to cure leprosy, snake bites, intermittent fevers, and other diseases. They are also employed all over India for suicidal and criminal purposes.

"Hasandhup," a deposit from a spring containing sulphur; the sediment is collected and made into cakes.

Specimens of raskapur (calomel), murda sand (oxide of lead), kahi (sulphate of iron), zangar (verdigris), nowshadar (sal-ammoniac), and other chemical preparations.

SECTION II.—PHARMACEUTICAL PREPARATIONS, ETHEREAL OILS, PERFUMERIES, DRUGS, and other Raw Products for PHARMACY and CHEMICAL INDUSTRY.

A.—PHARMACEUTICAL PREPARATIONS.

Cinchona Products from Indian grown cinchona bark. Exhibited by Clements Markham, Esq., C.B., London.
Quinovin.
Quinova sugar obtained from quinovin.
Quinidine (1871).
Pure sulphate of quinine from Cinchona officinalis.
Sulphate of quinine from Cinchona succirubra.
Quinovic acid.
Cinchonidine.
Cinchona, red.
Cinchonine (hydrochlorate) from Cinchona micrantha.
Amorphous quinine. Febrifuge. Manufactured in the Neilgherries.
Calcie-Quinate.

B.—ETHEREAL OILS AND PERFUMERIES.

Of scented oils there are two kinds found in Indian commerce, the one, being the cheapest, is a fatty oil, such as that of Sesame, scented with the odour of roses, jasmine, and other plants. The other scented oil is an essence or attar, obtained by direct distillation. Of course this latter varies in quality and purity, very many samples of attars being more or less adulterated with fatty oil. Pure attar is a strong volatile oil, and commands a high price. In Europe the attar of roses is best known and most highly esteemed; the purest and richest in India is manufactured in the neighbourhood of Ghazeepore.

Other "perfumeries" obtained from India are the raw materials of perfumery, such as scented woods and dried plants in the vegetable, and civet and musk in the animal kingdom. In addition to these may be mentioned scented powders, pastiles, and other preparations.

VEGETABLE PERFUMERIES.

A Collection of Attars from Delhi, exhibited by the Punjab Local Committee.

3,441. Khas. Anatherum muricatum.
Chambeli. Jasminum grandiflorum.
Guláb. Rosa centifolia.
Mahk pari.
Motya. Jasminum sambac.
Hazár gila.
Keora. Pandanus odoratissimus.
Kelki.
Nargis. Narcissus tazetta.
Panri. Stalk of betel leaf.
Champá. Michelia champaca.
Bed mushk. Salix caprea.
Gil. Earth.
Záfrán (saffron). Crocus sativus.

Haná. Lawsonia inermis.
Fitna.
Amber. Ambergris.
Chukhi baká.
Seonti.
Badshá pasand. Mimusops elengi.

3,442. 18 Specimens of Attars. Exhibited by the Local Committee, Amritsar.

A Collection of Attars or Essential Oils from Madras. Exhibited by Mir Goolab Futhoolah.

2,151. Mooteeyah Atur.
2,152. Munsuntoo Atur.
2,153. Heena Atur.
2,154. Goolabee Atur.
2,155. Ughur Atur.
2,156. Umber Atur.
2,157. Sandal Atur.
2,158. Kavoora Atur.
2,159. Moolsaree Atur.
2,160. Soohangh Atur.
2,161. Randa (scent).
2,162. Cheeksa (scent).
2,163. Burmakee, smoke of this used to the hair of the head.
2,164. Sandal Buddee (scent).
2,165. Phoola ka Thayl (oil of flower, of Moorgra, or Mullipoo).
2,166. Oodbuthee, or perfume sticks.
2,167. Rooghum-i, oil of rose.
2,168. Two Moohnalls of Sandal (fixed to the pipe of hooka).

Three Specimens of Fragrant Oils. Exhibited by Baloo Moodelliar, Madras.

2,169. Essential Oil of Orange.
2,170. Essential Oil of Pompelmose.
2,171. Sandal oil.

A Collection of Attars, &c., exhibited by Dr. Kanny Loll Dey, Calcutta.

4,813. Batavi-neboo-atar. Citrus rumphii.
4,814. Bela-atar. Jasminum sambac.
4,815. Bakul-atar. Mimusops elengi.
4,816. Chameli-atar. Jasminum grandiflorum.
4,817. Champa-atar. Michelia champaca.
4,818. Chandan-atar. Santalum album.
4,819. Dona-atar. Artemisia indica.
4,820. Gánda-atar. Marigold.
4,821. Golab-atar. Rosa damascena.
4,822. Grass oil. Andropogon iwarancusa.
4,823. Hena-atar. Lawsonia inermis.
4,824. Jáfran-atar (Kesar). Crocus sativus.
4,825. Jui-atar. Jasminum.
4,826. Kewra-atar. Pandanus odoratissimus.
4,827. Khuskhus-atar. Andropogon muricatum.
4,828. Kurna-ka-atar. Phœnix dactylifera.
4,829. Lemon grass oil (Ceylon). Andropogon schœnanthus.
4,830. Moti-atar. Jasminum hirsutum.
4,831. Matti-atar.
4,832. Masala-atar.
4,833. Musk-atar.
4,834. Nagkesor-atar. Mesua ferrea.
4,835. Pachapat-atar. Pogostemon patchouli.
4,836. Sassiferus-ka-atar. Camphora glandulifera.
4,837. Sohag-atar.
4,838. Sasa-atar. Cucumis sativus.

4,839. Mataghasa—a kind of potpourri, Mandee.
4,840. Mataghassa oil — Hair oil for Bengali ladies.
4,141. Mataghassa, Essence of, for Bengali ladies.

} Perfumes extracted from various plants.

A Collection of Attars and Perfumed Water, exhibited by Goolab Gandhee, of Ghazeepore.

3,906–7. Attar of roses. 1st quality.
3,908–9. Attar of roses. 2nd quality.
3,910–11. Attar of khus.
3,912–15. Rose water.
3,916–19. Khus water.

With these samples the following memorandum has been forwarded.

The roses from which the celebrated Ghazeepore rose-water is distilled came originally from Bussorah. These roses were first transplanted from Persia, and brought to the ancient, but now ruinous, Hindu city of Kanauj on the Ganges, and thence to Ghazeepore.

Somewhere about a century ago, Shaikh Abdullah (the father of the last Nawab Fuzl Alee Khan) made the first trial of a rose plantation in the vicinity of the city of Ghazeepore. Having experimented on a very limited scale in his own garden, he discovered that the soil of the environs of Ghazeepore was admirably adapted for rose cultivation, and since that period it has by degrees been extended.

The celebrity of the Ghazeepore perfumes prepared from these roses very soon spread throughout India, and to other countries, while to this day they have been held in the highest possible esteem on account of the permanence of the odour, and the peculiar delicate fragrance of the scent for which they are specially appreciated in the mercantile world. Year after year traders come from immense distances to work temporary distilleries, for the season only, in order to replenish their stock of these delicious and precious rose scents.

Culture of the Roses, and plantation of Rose Gardens.

Unlike the propagation of the Specimen-roses of England, which depend chiefly on grafting, these rose trees are raised from cuttings which are planted out from nurseries after one year's growth at an expense of Rs. 25 per beegah. These slips are watered every five or six days till the setting in of the rains, and when once they have taken root, they are finally transplanted to the field intended for the rose garden Here each rose tree is planted three feet apart from the other, and on an average 1,000 shrubs are allowed to grow in each beegah of land.

Rose fields are kept scrupulously clean by constant weeding, and loosening of the soil round the roots. This operation takes place about three times a year. Leaf-mould, which is the best sort of manure for roses, is sprinkled all over the fields once a year, and twice a year the fields are irrigated by flooding them with well water. Priming takes place annually in the month of January. The flowering season is in February and March, when the blossoms are picked and collected each day before sunrise.

The average yield of flowers per beegah is from 30 to 60,000. These are sold to the distillers at a rate varying from 100 to 125 rupees per lakh

(hundred thousand) of flowers. The total area under rose cultivation in Ghazeepore is estimated at about 200 acres, bearing an average rental of Rs. 4 per beegah.

Process of Manufacturing the pure Attar of Roses.

A gallon, or half a gallon, of the best rose-water is kept in a large copper vessel in the cool night air, with a thin cotton covering over it. Before day-break the oily extract floating over the surface of the water is carefully collected with a pigeon's feather and placed in a phial.

The next day fresh flowers are added to the water, and it is again distilled, and the same process is continued for several days successively, till as much pure attar of roses is collected as is required. The whole quantity thus collected is kept in a phial and exposed to the sun for a few days, and as soon as the watery particles have evaporated, pure oil, or attar of roses, is left in the phial, which sells by weight at Rs. 100 to Rs. 125 per tolah. This sort of attar being costly, is generally made only to order, and the ordinary quantity produced each year rarely exceeds 5 or 6 tolahs. The rose-water left after eight or nine distillations again comes into use, and is sold in the market as the best of its kind. It is in fact a clear profit to the manufacturer, who is already amply repaid by the attar itself. The prime cost of a tolah of attar is fairly estimated at Rs. 72, viz.:—

Cost of labour - -	Rs.	12	0	0
Value of 50,000 rose flowers at Rs. 120 per lakh -	Rs.	60	0	0
Total -	Rs.	72	0	0

The margin left to the manufacturer after covering the cost of interest on outlay does not fall far short of 40 or 50 rupees per tolah, which it must be admitted is not at all a bad profit on the transaction.

Manufacture of the alloyed or ordinary bazar-sold Attar.

Sandal wood is well pounded and mixed with water, and then subjected to the usual process of distillation with roses. This gives a greater quantity of oily substance than could be expected from roses only. The same water is distilled over and over again with an additional quantity of fresh flowers as many times as suits the fancy of the manufacturer.

The value of this attar rises in proportion to the number of distillations, and the best of the kind sells at Rs. 10 per tolah down to the lowest rate of Rs. 2 for the inferior sorts. The process of collection of this attar is the same as that of the other, the only difference between the two being in the admixture or not of sandal wood oil.

It is difficult to estimate with any degree of accuracy the quantity of alloyed attar annually produced in Ghazeepore, for a large number of outsiders come every year, stop for the season only, and then carry off what they produce. Probably a maund would be near the mark, but the value cannot be accurately computed, owing to the great variety of rates for the different qualities manufactured.

Manufacture of plain Rose-water.

The process is simple, but the varieties are great according to the number of flowers allowed to each distillation. The ordinary rose-water is sold in huge spherical glass receptacles called "karábás," each containing 14 quart bottles. The average selling price of ordinary rose-water varies from Rs. 2 to 12 per karába, and English quart bottles from 8 annas to 8 rupees each.

The usual cost of labour for each distillation yielding 24 bottles is one rupee. During the season numerous temporary rose-stills are worked by traders from different parts of India. Consequently it is very difficult to make even an approximate estimation of the actual quantity produced, but it if supposed to be somewhere between two and three hundred maunds.

R. SAUNDERS, *Collector.*

Perfumery Substances from India Museum, London.

3,324. White horehound. Pogostemon patchouli.
3,328. Rose buds. Rosa damascena.
3,295. Khus khus. Anatherum muricatum.

Four Attars from Indore, exhibited by the Local Committee.

842. Attar of roses.
Attar of keora.
Attar of jasmine.
Attar of mogra.

Four Essential Oils for perfumery, exhibited by H.H. the Guickwar of Baroda.

ANIMAL PERFUMERIES.

Musk. Moschus moschiferus, *Linn.* Mishk, or Mooshk, *A.; P.* Mooshka. *Sans.* Nafey-moosh. *Nepal.* Kustooree. *H.* Rutta-urula. *Cyn.* Toshikana, Cashmere. India Museum.

The musk deer is an important object of the chase in the countries in which it occurs, on account of the substance called *musk*, which is secreted in a cavity of the abdomen of the male. The animal inhabits the mountainous districts of Central Asia. It is common in Nepal, Bhotan, Tibet, and the adjacent countries. About 100 musk balls or "pods" are imported annually into Leh in Ladakh, where they are valued at from 7 to 15 rupees each.

The quantity of musk exported from India during the official year 1871-2, was 2,993 ounces, valued at rupees 36,152.

C.—DRUGS AND OTHER RAW PRODUCTS FOR PHARMACY.

The materia medica of India can be grouped most conveniently under three headings:—

1. Officinal, according to the Pharmacopœia of India;
2. Non-officinal, but included in the Pharmacopœia of India;
3. Reputed medicinal substances not included in the Pharmacopœia of India.

The last group includes an immense quantity of substances which have a repute with the natives, but the majority of which are probably inert or inferior to other drugs, which are equally cheap and accessible. In most of the exhibits this arrangement has not been followed, but is now suggested as an advantage for the future.

A Collection of Materia Medica exhibited by Surgeon G. Bidie, M.B., Madras.

1,534. Capsicum annuum. *Eng.* Chillies; *Tam.* Moolagha; *Tel.* Mirai-pa-kaya; *Duk.* Mirchi; *Can.* Menashina kayi.

1,535. Coriandrum sativum. *Eng.* Coriander; *Tam.* Kottamalli; *Tel.* Daniyalu; *Duk.* Dhanyan; *Can.* Kottamari-bija.

1,536. Trigonella fœnum-græcum. *Eng.* Fenugreck seeds; *Tam.* Vendayam; *Tel.* Mentulu; *Duk.* Methi; *Can.* Menthya.

1,537. Cuminum cyminum. *Eng.* Cumin; *Tam.* Siragam; *Tel.* Jiraka; *Duk.* Jira; *Can.* Jirage,

1,538. Sinapis juncea. *Eng.* Country mustard; *Tam.* Kadughu; *Tel.* Avalu; *Duk.* Rai; *Can.* Sasave.

1,539. Punica granatum. *Eng.* Pomegranate rind; *Tam.* Mudalaip-pasham; *Tel.* Dalimba-pandu; *Duk.* Anar; *Can.* Dalimbi-kayi.

1,540. Tinospora cordifolia. *Eng.* Gulancha; *Tam.* Shindil-kodi; *Tel.* Gaduchi; *Duk.* Gulbel; *Can.* Auruta-balli.

1,541. Mucuna pruriens. *Eng.* Cowhage; *Tam.* Punaik-kali; *Tel.* Pedda-dulagandi; *Duk.* Kanch-kura; *Can.* Turachi-gida.

1,542. Carum ajowan. *Eng.* Omun seeds; *Tam.* Omum; *Tel.* Vamamu; *Duk.* Ajvan; *Can.* Voma.

1,543. Polanisia icosandra. *Eng.* Wild mustard; *Tam.* Nay-kadughu; *Tel.* Kookka-avalu; *Duk.* Jungli-hulvul; *Can.* Hoocha-sasave.

1,544. Cubeba officinalis. *Eng.* Cubebs; *Tam.* Valmilaku; *Tel.* Chalava-miriyalu; *Duk.* Kabab-chini; *Can.* Balamenasu.

1,545. Elettaria cardamomum. *Eng.* Cardamoms; *Tam.* Elakay-virai; *Tel.* Elakaya-vittulu; *Duk.* Ilachi; *Can.* Yalakki.

1,546. Caryophyllus aromaticus. *Eng.* Cloves; *Tam.* Kirambu; *Tel.* Lavangalu; *Duk.* Lavang; *Can.* Lavanga.

1,547. Plantago ispaghula. *Eng.* Spogel seeds; *Tam.* Iskol-virai; *Tel.* Ispagala-vittulu; *Duk.* Isapghol; *Can.* Isabakolu.

1,548. Nigella sativa. *Eng.* Black fennel; *Tam.* Karum Siragum; *Tel.* Nalla-jilakara; *Duk.* Kalazira; *Can.* Kare-jirage.

1,549. Pimpinella anisum. *Eng.* Anise; *Tam.* Shombu; *Tel.* Sopu; *Duk.* Sonf; *Can.* Sompu.

1,550. Anethum sowa. *Eng.* Dill (Indian); *Tam.* Shatakuppai-virai; *Tel.* Soyikura-vittulu; *Duk.* Soyi; *Can.* Sabbasagi.

1,551. Hyoscyamus niger. *Eng.* Henbane seeds; *Tam.* Kurasani-yomam; *Tel.* Kurasani-vanam; *Duk.* Kurasani ajvan; *Can.* Kurasani-vadakki.

1,552. Pharbitis nil. *Eng.* Kaladana seeds; *Tam.* Jiriki-virai; *Tel.* Kolli-vittooloo; *Duk.* Zirkike beenj.

1,553. Cinnamomum (?). *Eng.* Cassia-buds; *Tam.* Siroo-naga-poo; *Duk.* Doomake-kali-mirchi.

1,554. Hydnocarpus inebrians. *Tam.* Niradi-muttu; *Tel.* Niradi-vittulu; *Duk.* Jangli baddam.

1,555. Anamirta cocculus. *Eng.* Cocculus Indicus seeds; *Tam.* Kakkaykolli-virai; *Tel.* Kaga mari; *Duk.* Kakmarike-bing; *Can.* Kakamari-bija.

1,556. Strychnos potatorum. *Eng.* Clearing nut; *Tam.* Tettan-kottai; *Tel.* Chilla-ginjalu; *Duk.* Chil-bing; *Can.* Chilli-bija.

1,557. Cæsalpinia bonducella. *Eng.* Bonduc nuts; *Tam.* Gechcha kay; *Tel.* Gachchakaya; *Duk.* Gajga; *Can.* Gajagakayi.

1,558. Argemone mexicana. *Eng.* Mexican thistle; *Tam.* Brama-dandu-virai; *Tel.* Bramha-dandi-vittulu; *Duk.* Pila-datura; *Can.* Daturi-bija.

1,559. Cassia lanceolata. *Eng.* Senna; *Tam.* Nilavakai; *Tel.* Nelatangedu; *Duk.* Natkisana; *Can.* Nelavarike.

1,560. Terminalia chebula. *Eng.* Myrobalans; *Tam.* Kaduk-kay; *Tel.* Karak kaya; *Duk.* Halda; *Can.* Alale-kayi.

1,561. Strychnos nux-vomica. *Eng.* Nux-vomica; *Tam.* Ettikkotai; *Tel.* Mushti-vittulu; *Duk.* Kuchle-ke-bing; *Can.* Mushti-bija.

1,562. Picrorrhiza kurroa. *Tam.* Katuku-rogani; *Tel.* Katuku-roni; *Duk.* Kali-kutki.

1,563. Zingiber officinale. *Eng.* Dried ginger; *Tam.* Sookku; *Tel.* Sonti; *Duk.* Sont; *Can.* Vanasunthi.

1,564. Chavica roxburghii. *Eng.* Long pepper; *Tam.* Tippili; *Tel.* Pippalu; *Duk.* Pipli; *Can.* Yippali.

1,565. Smilax china. *Eng.* China root; *Tam.* Paringay chekay; *Duk.* Chobchinie.

1,566. Elettaria cardamomum. *Eng.* Cardamoms; *Tam.* Ela-kay; *Tel.* Ela-kaya; *Duk.* Ilachi; *Can.* Yalakki.

1,567. Calotropis gigantea. *Eng.* Mudar-root bark; *Tam.* Erukkam; *Tel.* Mandaramu; *Duk.* Ak; *Can.* Yakkedagidda.

1,568. ——. *Eng.* Salep (grown on the Neilgherries); *Tam.* Shala-mishiri; *Tel.* Sala-misiri; *Duk.* Saalab-misiri.

1,569. Helicteres isora. *Eng.* Hazel-leaved Hellicteres; *Tam.* Valumbirikai; *Tel.* Valumbrikaca; *Duk.* Merowin.

1,570. Coscinium fenestratum. *Tam.* Maramanjal; *Tel.* Manupasupu; *Duk.* Jhar-kihaldi; *Can.* Maradaarishina.

1,571. Cinnamomum zeylanicum. *Eng.* Cinnamon; *Tam.* Lavanga-pattai; *Tel.* Lavanga-patta; *Duk.* Dal-chini; *Can.* Dala-chinnie.

1,572. Ægle marmelos. *Eng.* Bael; *Tam.* Vilvapayham; *Tel.* Bilvapandu; *Duk.* Bel-phal; *Can.* Billapatri-hanum.

1,573. Toddalia aculeata. *Eng.* Toddalia bark; *Tam.* Milakaranai; *Tel.* Kenda-kasinda-chettu.

1,574. Uncaria gambir. *Eng.* Pale catechu; *Tam.* Kashu; *Tel.* Kanchu; *Duk.* Kattah; *Can.* Kachu.

1,575. Acacia catechu. *Eng.* Catechu; *Tam.* Kashu; *Tel.* Kanchu; *Duk.* Kattah; *Can.* Kachu.

1,576. Gracilaria lichenoides. *Eng.* Ceylon moss; *Tam.* Kadal-pach-chi; *Tel.* Samudrapu pachi; *Duk.* Mas.

1,578. Pterocarpus marsupium. *Eng.* Kino; *Tam.* Kanda murga-mirattave; *Tel.* Ganda murgam netturu; *Duk.* Dammulakhvam.

1,579. Narthex assafœtida. *Eng.* Assafœtida; *Tam.* Perunkayam; *Tel.* Inguva; *Duk.* Hing; *Can.* Ingu.

1,580. Aloe vulgaris. *Eng.* Aloes; *Tam.* Kinya polam; *Tel.* Mushambaram; *Duk.* Elva.

1,581. Anamirta cocculus. *Eng.* Cocculus indicus; *Tam.* Kakkay-Kollai virai; *Tel.* Kaka-mari; *Duk.* Kakmari-ke-bing; *Can.* Kakamari bija.

A COLLECTION of the INDIGENOUS DRUGS of INDIA obtainable at the Native Drugshops, and chiefly used by the Kobeerajes and Hakeems. Many of these drugs have been already introduced into European practice in charitable hospitals and dispensaries.

Exhibited by Dr. KANNY LOLL DEY, Rai Bahadur, Calcutta.

—	Name and Description of Article.				Price of Article at Place of Production.
	Scientific Name.	Provincial Name.	Officinal Part.	Physiological Action.	Per lb. Rs. A. P.
4,551	Abelmoschus esculentus	Dhenras	Capsules	Demulcent	0 2 0
4,552	Abroma angustum	Ulatkambal	Root-bark	Specific in dysmenorrhœa.	2 0 0
4,553	Abrus precatorius	Kunch	Root	Demulcent	0 3 0
4,554	Acacia arabica	Babúl	Gum, bark	Demulcent astringent.	1 4 0
4,555	Acacia catechu	Khayer; kuth	Root (extract)	Astringent	2 0 0
4,556	Acalypha indica	Muktajhuri	Leaves	Laxative	0 5 0
4,557	Achyranthes aspera	Apang	Flowering-tops	Diuretic	0 4 0
4,558	Aconitum?	Kalkut	Root	Poison	2 8 0
4,559	Aconitum heterophyllum	Athish	Root	Febrifuge	2 0 0
4,560	Aconitum napellus	Kat bish	Root	Febrifuge, poison	2 0 0
4,561	Acorus calamus	Bach	Root (*sweet flag*)	Stimulant	0 6 0
4,562	Adhatoda vasica	Bákas	Whole plant	Antispasmodic	0 8 0
4,563	Ægle marmelos	Bel; shriphal	Unripe fruit (*Bengal quince*).	Astringent	0 4 0
4,564	Æschynomene sesban	Jeyanti path	Leaves	Absorbent	0 4 0
4,565	Agathotes chirayta	Chireta	Whole plant	Bitter tonic	0 8 0
4,566	Agave americana	Bakas path	Root	Diuretic	0 2 0
4,567	Aleurites triloba	Akhrot	Kernel oil	Aperient	0 8 0
4,568	Alhagi maurorum	Jávási	Saccharine exudation (*Hebrew manna*).	Aperient	4 0 0
4,569	Aloe indica	Grita kumari	Inspissated juice	Purgative	0 12 0
4,570	Alpinia galanga	Kálánjan	Tubers	Aromatic	0 4 0
4,571	Alstonia scholaris	Chátin	Bark	Tonic	0 8 0
4,572	Alumen (Alum)	Fátkiri	Salt	Astringent	0 8 0
4,573	Ammoniæ hydrochloras	Nishedal	Salt	Alterative	0 8 0
4,574	Amomum cardamomum	Bara-elachi	Seeds	Aromatic	1 0 0
4,575	Anacardium occidentale	Hijli badam	Nuts(*Cashew-nut*)	Vesicant	0 2 0
4,576	Andrographis paniculata	Kalmeg	Whole plant (*Kreat*).	Bitter tonic	0 4 0
4,577	Andropogon muricatum	KhashKhash; bala	Root	Gentle stimulant	0 0 6
4,578	Anthemis nobilis	Babuna-phul	Flower	Stomachic	0 4 0
4,579	Anthemis pyrethrum	Akarkara	Root	Sialogogue	0 12 0
4,580	Antimonii ter-sulphuretum	Rasánjan súrmá	Salt	Astringent	0 8 0
4,581	Arachis hypogæa	Chína-bádám	Legumes & the oil	Emollient	0 1 0
4,582	Areca catechu	Sûpári; gôá	Nut (*charcoal*)	Astringent	0 1 6
4,583	Argemone mexicana	Shiálkántá	Seed oil	Emollient	0 2 0
4,584	Aristolochia indica	Isérmùl	Root	Emenagogue	0 4 6
4,585	Arsenic (white, red, and yellow)	Senko, dármûj haritál.	Salt	Febrifuge, poison	1 0 0
4,586	Artemisia indica	Doná	Leaves	Aromatic	0 5 0
4,587	Asparagus sarmentosus	Sata-mulì	Bulbous root	Demulcent	0 5 0
4,588	Asteracantha longifolia	Kanta-kaliká	Root	Diuretic	0 2 0
4,589	Astragalus vera	Katilá	Gum (*tragacanth*)	Demulcent	0 10 0
4,590	Azadirachta indica	Nim	Bark	Bitter, febrifuge	0 4 0
4,591	Balsamodendron mukul	Gûggul	Resin (*Indian Bedellium*).	Alterative	0 6 0
4,592	Balsamodendron myrrha	Hirabal	Gum-resin	Emenagogue	2 0 0
4,593	Bassia latifolia	Mahûá	Seed oil	Emollient	0 3 0
4,594	Berberis lycium	Rasaût	Watery extract of the plant).	Febrifuge	0 8 0

Those articles that are placed within parenthesis in italics are Indian substitutes for pharmacopœial drugs. The prices given are the retail prices in the Calcutta Bazar.

—	Name and Description of Article.				Price of Article at Place of Production.
	Scientific Name.	Provincial Name.	Officinal Part.	Physiological Action.	Per lb. Rs. A. P.
4,595	Boswellia thurifera	Gandhabirajá	Gum-resin (*Olibanum*).	Rubefacient	0 6 0
4,596	Butea frondosa	Palaspapra	Seeds (*Gum, Bengal kino*).	Anthelmintic	0 7 0
4,597	Cæsalpinia bonduc	Katkaranjá	Seeds	Febrifuge	0 12 0
4,598	Cæsalpinia sappan	Bakam	Wood (*Hæmatoxline*).	Astringent	0 4 0
4,599	Coffea arabica	Káfi	Seeds	Stimulant	1 0 0
4,600	Calotropis gigantea	Akanda	Root (*Ipecacuanha*)	Emetic, alterative	0 4 0
4,601	Camphora glandulifera	Nepal Sasafras	Wood	Diaphoretic	1 0 0
4,602	Canarium commune	Jangli-bádám	Gum Elemi	Stimulant	0 1 6
4,603	Cannabis indica	Ganja	Flowering tops	Narcotic	3 0 0
4,604	Ditto	Charas	Resin	Antispasmodic	4 0 0
4,605	Ditto	Bháng	Leaves	Stimulant	0 12 0
4,606	Capsicum annuum	Lálmaricha; lanka	Fruits	Stimulant	0 7 0
4,607	Carica papaya	Penpe	Seeds	Anthelmintic	0 3 0
4,608	Carum album	Jira	Fruits	Carminative	0 7 0
4,609	Carum nigrum	Sájirá	Fruits	Carminative	1 4 0
4,610	Caryophyllus aromaticus	Lavanga	Unexpanded flowers.	Aromatic	0 6 0
4,611	Cassia alata	Dad-mardan pata	Leaves	Efficacious in ringworm.	0 2 0
4,612	Cassia elongata	Sonamukhi	Leaves	Purgative	0 12 0
4,613	Cassia fistula	Sodal	Pulp of the pods	Laxative	0 9 0
4,614	Cinnamomum albiflorum	Tejpat	Leaves, bark	Aromatic, demulcent.	0 3 0
4,615	Cinnamomum zeylanicum	Dharchini	Bark	Aromatic, stimulant	0 10 0
4,616	Cissampelos hexandra	Nimuka	Root	Diuretic	0 3 0
4,617	Citrus aurantium	Kamlálebu	Dried-peels	Aromatic	0 4 0
4,618	Citrus limonum	Patilebu	Fruits	Antiscorbutic	0 4 0
4,619	Clitoria ternatea	Aprajita	Root	Brisk purgative	0 8 0
4,620	Clerodendron viscosum	Bhant	Leaves	Vermifuge	0 2 0
4,621	Cocculus cordifolius	Golancha	Whole plant	Tonic, febrifuge	0 2 0
4,622	Cocculus indicus	Kakmari	Fruit	Extract to destroy vermin.	1 0 0
4,623	Cocculus palmatus	Kalamba	Root	Bitter tonic	3 0 0
4,624	Coccus cacti	Krindana	Insect (*cochineal*)	Colouring ingredient.	0 8 0
4,625	Cocos nucifera	Narkol	Fruit, Cocoanut oil	Nutritious, emollient	0 4 0
4,626	Convolvulus scammonia	Sukmuniya	Gum-resin	Cathartic	2 8 0
4,627	Conyza anthelmintica	Somraj	Seeds	Anthelmintic	0 3 0
4,628	Coptis teeta	Mismitita	Roots	Bitter tonic	1 0 0
4,629	Corchorus olitorius	Laltepata	Leaves	Bitter tonic	0 3 0
4,630	Coriandrum sativum	Dhaniya	Fruits	Carminative	0 2 0
4,631	Creta (carbonate of lime)	Khadimati	Chalk	Antacid	0 1 0
4,632	Crinum asiaticum	Bara-kanur	Bulb	Emetic	0 4 0
4,633	Crocus sativus	Japhran	Stigmata (*Saffron*)	Emenagogue	4 0 0
4,634	Croton tiglium	Jamalgota, jayapal	Seeds, oil	Drastic purgative	0 8 0
4,635	Cucumis colocynthis	Indrani	Seeds	Purgative	0 4 0
4,636	Cucumis sativus	Sasa	Seeds	Diuretic	0 8 0
4,637	Cucumis utilissimus	Kankur	Seeds	Diuretic	0 8 0
4,638	Cupri sulphas	Tunte	Salt	Astringent	0 8 0
4,639	Curcas purgans	Bag-bheranda	Seeds	Drastic purgative	0 2 0
4,640	Curcuma longa	Halud, haridra	Root	Carminative	0 1 6
4,641	Curcuma zedoaria	Bon-halud, suti	Root	Carminative	0 2 0
4,642	Cydonia vulgaris	Bihidana	Seeds	Demulcent	1 4 0
4,643	Cyperus hexastachyus	Mutha	Root	Diuretic	0 2 0
4,644	Cyperus pertenuis	Nagar mutha	Root	Diuretic	0 2 0
4,645	Datura alba	Sada dhatura	Seeds, leaves	Narcotic, anodyne, poison.	0 5 0

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—	Name and Description of Article.				Price of Article at Place of Production.
	Scientific Name.	Provincial Name.	Officinal Part.	Physiological Action.	Per lb. Rs. A. P.
4,646	Datura fastuosa	Kala dhatura	Seeds, leaves	Narcotic, anodyne, poison.	0 5 0
4,647	Diospyros embryopteris	Gab	Fruit	Astringent	0 1 0
4,648	Dipterocarpus lævis	Garjan têl	Exudation (Balsam).	Diuretic	0 8 0
4,649	Dracocephalum royleanum	Tak-balanga	Seeds	Demulcent	0 12 0
4,650	Ocymum basilicum	Babui-tulsi-bij	Seeds	Demulcent	0 12 0
4,651	Elettaria cardamomum	Chhota-elachi	Seeds	Aromatic	4 0 0
4,652	Emblica officinalis	Amlá	Fruit	Astringent	0 2 0
4,653	Embelia ribes	Birangá	Berries	Anthelmintic	0 6 0
4,654	Erythrina indica	Pálte-mádár	Leaves, bark	Febrifuge	0 1 0
4,655	Eupatorium ayapana	Ayápáná	Leaf-juice	Astringent	0 3 0
4,656	Euphorbia ligularia	Mansá-sij	Leaf-juice	Diuretic, abortive	0 1 0
4,657	Euphorbia nivulia	Sij	Leaf-juice	Diuretic, ditto	0 1 0
4,658	Feronia elephantum	Kathbél	Gum	Demulcent	0 4 0
4,659	Ferri sulphas	Hirekas	Salt	Tonic	0 2 0
4,660	Fœniculum panmorium	Pánmaûri	Fruit	Carminative	0 5 0
4,661	Garcinia mangostana	Mangoshtin	Fruit-rind	Astringent	1 0 0
4,662	Garcinia pictoria	Gamboj	Concrete juice	Purgative	0 4 0
4,663	Gentiana kurroo	Karu	Root	Bitter tonic	0 8 0
4,664	Glycyrrhiza glabra	Yaishta-madhu	Root	Demulcent	0 8 0
4,665	Gmelina asiatica	Gomadhu	Bark, fruit	Demulcent	0 2 0
4,666	Gmelina parviflora	Sri-gomadhu	Root	Demulcent	0 2 0
4,667	Gynocardia odorata	Chálmûgra	Seeds, oil	Emollient, anti-leprous.	2 0 0
4,668	Helleborus niger	Kala-kutki	Root	Cathartic	0 8 0
4,669	Hermodactylus	Suranjan-ttvak	Bulbs	Diuretic	2 0 0
4,670	Hemidesmus indicus	Ananta-mûl	Roots (*Indian Sarsaparilla*).	Alterative	0 6 0
4,671	Hibiscus abelmoschus	Kala kastûrí	Seeds	Stomachic	1 0 0
4,672	Hirudo medicinalis	Jonk	Leech	Abstraction of blood.	0 2 0
4,673	Hydrargyri chloridum cum bichloridum.	Rasakarpûr	Salt	Alterative	6 0 0
4,674	Hydrargyri persulphuretum	Hingul	Salt	Alterative	3 0 0
4,675	Hydrocotyle asiatica	Thalkûrí	Leaves	Bitter tonic	0 2 0
4,676	Hyoscyamus niger	Khorasání-ájwana	Leaves, seeds	Anodyne	1 0 0
4,677	Ichnocarpus frutescens	Syámá latá	Whole plant	Alterative	0 12 0
4,678	Indigofera tinctoria	Níl	Leaves, extract	Alterative	2 0 0
4,679	Ipomœa turpethum	Teûrí	Root, bark	Purgative	0 12 0
4,680	Iris florentina	Begbanóphshá	Root (*Orrisroot*)	Scent for tooth-powder.	0 12 0
4,681	Juniperus communis	Abul	Berris	Diuretic	0 4 0
4,682	Laurus camphora (Camphora officinarum).	Karpûr	Volatile extract	Stimulant	1 4 0
4,683	Lepidium sativum	Halim	Seeds	Aperient	0 5 0
4,684	Ligusticum diffusum	Banjoyán	Seeds	Carminative	0 4 0
4,685	Ligusticum (ptychotis) ajowan	Ajoyan	Seeds	Carminative	0 5 0
4,686	Linum usitatissimum	Tishí, masina	Seeds, oil	Demulcent	0 2 0
4,687	Luffa echinata	Bandál	Whole plant	Alterative	0 4 0
4,688	Lygodium (ophioglossum) flexuosum.	Bhuth-raj	Leaves	Errhine	0 8 0
4,689	Malva mauritiana	Kagni-pat	Seed	Demulcent	0 10 0
4,690	Mangifera indica	Amra kasi	Kernel	Astringent	0 8 0
4,691	Manna officinalis	Shir khist	Concrete exudation.	Laxative	3 0 0
4,692	Maranta arundinacea	Ararut	Fecula	Food for invalids	0 6 0
4,693	Mel (Apis mellifica)	Madhu	Saccharine secretion.	Expectorant	0 5 0
4,694	Meloe (Mylabris cichorii)	Telini-poka	Vesicating-fly	Vesicant	1 8 0

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—	Name and Description of Article.				Price of Article at Place of Production.
	Scientific Name.	Provincial Name.	Officinal Part.	Physiological Action.	Per lb. Rs. A. P.
4,695	Mentha sativa	Pudiná	Whole herb	Stomachic	0 4 0
4,696	Mesua ferrea	Nagkesór	Dried flower	Astringent	0 8 0
4,697	Michelia champaca	Chanpa	Bark	Aromatic	0 2 0
4,698	Momordica charantia	Karala; uchchhiya	Leaves	Anthelmintic, febrifuge.	0 2 0
4,699	Momordica dioica	Ghoshal-phal	Fruit, infusion	Errhine	0 4 0
4,700	Moringa pterygosperma	Sajina	Root (*like horse radish*).	Rubefacient	0 4 0
4,701	Mucuna (pruriens) pruritus	Alkushi	Hairs covering the pods.	Anthelmintic	0 2 0
4,702	Myrica sapida	Kai-phal	Fruit	Errhine	0 4 0
4,703	Myristica (moschata) officinalis	Jaya-phal; Jayitri	Seeds (*Nutmeg*) Arilla.	Aromatic	1 8 0
4,704	Nardostachys (valeriana) jatamansi.	Jatamansi; sambul.	Root	Antispasmodic	0 6 0
4,705	Narthex assafœtida	Hing	Gum Resin	Antispasmodic	0 6 0
4,706	Nerium odorum alba	Svet karabi	Root (oleander)	Poisonous	2 8 0
4,707	Nicotiana tabacum	Tamaku	Leaves	Sedative	0 5 0
4,708	Nigella sativa	Kala-jira	Seeds	Lactagogue	0 4 0
4,709	Nymphœa solus	Saluk	Seeds, fried	Food for invalids	0 2 0
4,710	Oldenlandia biflora	Khetpapra	Whole plant	Tonic	0 4 0
4,711	Onosma echioides	Ratan jut	Bulb (*alkanet*)	Colouring article	1 4 0
4,712	Orchis mascula	Salep misri	Tuber	Food for invalids	0 12 0
4,713	Oryza sativa	Chaul	Seeds (rice)	Article of diet	0 1 0
4,714	Oxalis corniculata	Amrûl	Whole plant	Refrigerent	0 2 0
4,715	Papaver somniferum	Posto-dana	Capsules, gum-resin (*poppy*).	Narcotic	0 4 0
4,716	Pæderia fœtida	Gandha bhaduli	Leaves	Astringent	0 4 0
4,717	Pedalium murex	Bara gokhura	Fresh leaves	Diuretic	0 10 0
4,718	Pharbitis nil	Kala-dana	Seeds	Purgative	0 4 0
4,719	Pharbitis (shapussundo)	Sáprasand	Seeds	Purgative	0 8 0
4,720	Phylanthus urinaria	Hajar-moni	Whole plant	Diuretic	0 4 0
4,721	Pinus deodara	Debdaru	Leaves	Diuretic	0 2 0
4,722	Pinus longifolia	Gandha-biraj	Resin	Stimulant	0 4 0
4,723	Piper chavica (Chavica betel)	Pan	Leaves (*betel leaf*)	Masticatory	0 2 0
4,724	Piper chaba	Chai	Wood	Aromatic	0 8 0
4,725	Piper cubeba	Kababchini	Berries (*cubeb*)	Diuretic	1 4 0
4,726	Piper longum	Pipûl	Dried female catkins (*long pepper*).	Stimulant	0 5 0
4,727	Piper nigrum	Gol-marich	Dried berries	Condiment	0 2 0
4,728	Pistacia lentiscus	Rami mastingi	Resin	Masticatory	2 8 0
4,729	Plantago ispaghula	Isabgûl	Seeds	Demulcent	0 3 0
4,730	Plumbago rosea	Lalchitra	Root, bark	Rubifacient, abortive.	0 4 0
4,731	Plumbago zeylanica	Chita	Root, bark	Vesicant, abortive	0 4 0
4,732	Plumbi carbonas	Saphéda	Salt	Sedative	0 4 0
4,733	Plumbi oxidum	Mudra sankha	Oxide	Tonic	0 6 0
4,734	Plumbi oxidum, rubrum	Mêtê sindur	Oxide	Paint	0 3 0
4,735	Pogostemon patchouli	Pacha pat	Leaves	Cosmetic	0 6 0
4,736	Polanisia icosandra	Hurhuriá	Leaves	Vesicant	0 8 0
4,737	Polynemus plebeus	Sele-machh	Fish bladder (*Indian isinglass*).	Food for invalids	0 1 6
4,738	Potassæ nitratis	Sóra	Salt	Diuretic	0 10 0
4,739	Prunus bokhariensis	Alúbokhárá	Fruit	Deobstruent	0 12 0
4,740	Psoralea corylifolia	Babchi; hakuch	Seeds	Rubifacient; specific for leucoderma.	0 4 0
4,741	Pterocarpus marsupiu m	Komorkasa	Gum resin (*Gum kino*).	Astringent	0 2 0

Those articles that are placed within parenthesis in italics are Indian substitutes for pharmacopœial drugs. The prices given are the retail prices in the Calcutta Bazaar.

—	Name and Description of Article.				Price of Article at Place of Production.
	Scientific Name.	Provincial Name.	Officinal Part.	Physiological Action.	Per lb. Rs. A. P.
4,742	Pterocarpus santalinus	Rakta chandan	Wood	Astringent	0 1 6
4,743	Ptychotis involucrata	Rándûní	Seeds	Stomachic	0 1 0
4,744	Punica granatum	Dalim chhal	Fruit rind (*pomegranate*).	Astringent	0 4 0
4,745	Quercus infectoria	Májû phal	Gall-nut	Astringent	0 6 0
4,746	Rheum emodi, &c.	Reo chini	Root (*rhubarb*)	Purgative	0 3 0
4,747	Ricinus communis	Bherenda	Seeds (*castor-oil*)	Purgative	0 8 0
4,748	Rottlera tinctoria	Kamala gûrí	Red mealy powder covering the capsules.	Vermifuge	0 3 0
4,749	Rubia munjista	Manjit	Roots	Deobstruent	0 1 0
4,750	Ruellia litebrosa	Bûri-gopan	Leaf-juice	Astringent	0 4 0
4,751	Saccharum officinarum	Ak	Sugar	Food	0 4 0
4,752	Sagus lævis	Ságû	Fecula	Food for invalids	0 3 0
4,753	Sapindus emarginatus	Rita	Pericarp	Detergent	0 1 0
4,754	Scilla indica	Jangli-piaj	Bulbs (*Indian squill*).	Expectorant	0 4 0
4,755	Semecarpus anacardium	Bhelá	Seeds	Rubifacient	0 2 0
4,756	Sesamum orientale	Til	Seed (*Sesamum oil*).	Emollient	0 1 0
4,757	Sida acuta	Kurita	Root	Bitter tonic	0 8 0
4,758	Potassa silicate	Bansalóchan	Concretion from Bamboo-joints.	Astringent	1 8 0
4,759	Sinapis alba	Sádá sarshapa	Seed	Stimulant	0 2 0
4,760	Sinapis nigra	Kála sarshapa	Seed-oil	Stimulant	0 2 0
4,761	Smilax China	Topchini	Root	Alterative	1 4 0
4,762	Sodæ biboras	Sóhágá	Salt	Detergent	0 5 0
4,763	Sodæ carbonas	Sáji máti	Salt	Antacid	0 1 0
4,764	Sodæ murias	Nimuk	Salt	Stomachic	0 1 0
4,765	Sodæ sulphas	Kharinun	Salt	Purgative	0 2 0
4,766	Solanum indicum	Byangal	Root	Diuretic	0 1 0
4,767	Solanum jacquini	Kanti kari	Berries	Expectorant	0 1 6
4,768	Soymida febrifuga	Rohan	Bark	Febrifuge	0 2 0
4,769	Sphæranthus hirtus	Chagal nadi	Whole plant	Diuretic	0 1 0
4,770	Strychnos ignatia	Pyapita	Seeds	Bitter tonic	0 8 0
4,771	Strychnos nux-vomica	Küchlá	Seeds	Nervine tonic	0 3 0
4,772	Strychnos potatorum	Nirmáli	Seeds	Used for clearing muddy water.	0 3 0
4,773	Styrax benzoin	Loban	Balsam	Expectorant	1 0 0
4,774	Sulphur	Gandhak	Sulphur	Laxative	0 13 0
4,775	Tamarindus indica	Tintiri, tentul	Pulp of the fruit	Refrigerant	0 0 6
4,776	Terminalia belerica	Bahera	Fruit	Astringent	0 1 0
4,777	Terminalia chebula	Huritakí	Fruit	Ripe astringent; unripe purgative.	0 2 0
4,778	Tiaridium indicum	Háti súró	Leaves	Emollient	0 1 0
4,779	Trapa bispinosa	Paniphal; singara	Fruit	Food for invalids	0 3 0
4,780	Trichosanthes dioica	Patal	Root	Purgative	0 4 0
4,781	Trigonella fœnum-græcum	Meti	Seeds	Stomachic	0 1 6
4,782	Uncaria gambir	Gambar kat	Root, extract	Astringent	0 6 0
4,783	Uvæ passæ	Kismis	Dried fruit	Article of food	0 3 0
4,784	Valeriana Hardwickii	Tag-ar	Root	Antispasmodic	Not known
4,785	Vateria indica	Capal	Gum	Alterative	1 4 0
4,786	Viola odorata	Banópsa	Whole plant	Diaphoretic	0 8 0
4,787	Vitex negundo	Nirgandhi	Whole plant	Bitter tonic	0 2 0
4,788	Vitex trifolia	Nisindá	Leaves	Bitter tonic	0 1 0
4,789	Wrightia antidysenterica	Kurchi; Inthrajav	Root, bark, seeds	Astringent	0 10 0
4,790	Zingiber officinale	Ada; sûnt	Rhizome	Carminative	0 6 0
4,791	Zingiber zerumbet	Bach	Ditto	Stimulant	0 4 0

Those articles that are placed within parenthesis in italics are Indian substitutes for pharmacopœial drugs. The prices given are the retail prices in the Calcutta Bazaar.

—	Local Number of Article.	Name and Description of Article.					Remarks by Local Committee.
		Commercial Name.	Provincial Name.	Scientific Name.	Specific Gravity.	Centesimal Yield.	
4,792	242	Almond oil (Indian)	Badam têl -	Terminalia catappa.	—	5	Not a commercial article; occasionally used in preparations of food, but chiefly as a hair oil.
4,793	243	Bassia oil - -	Mahua têl -	Bassia latifolia	0·9727	30–35	Extensively used for adulterating ghee; also for burning as a lamp oil.
4,794	244	Cashew nut oil, kernel.	Hijli-badam têl.	Anacardium occidentale.	0·9160	10–15	Use the same as No. 242.—Is as good as olive oil.
4,795	245	Ditto, crust -	Ditto -	Ditto -	—	10	Used medicinally as a rubefacient.
4,796	246	Castor oil - -	Redi têl -	Ricinus communis.	0·9611	28–35	
4,797	247	Chalmugra seed oil.	Chalmugra têl	Gynocardia odorata.	0·9613	15–25	Used extensively as an emollient and specific curative in leprosy. The specimen forwarded is less clear than can be obtained in the summer months. The seeds procurable in the cold weather will not yield a clear oil.
4,798	248	Cocoa-nut oil -	Narcol têl -	Cocos nucifera	0·9288	40	
4,799	249	Cotton seed oil -	Tula bij têl -	Gossypium herbaceum.	—	20	
4,800	250	Fennel seed oil, or kalajira oil.	Kalajira têl -	Nigella sativa	—	10	An excellent lactagogue; used also for confections.
4,801	251	Ground nut oil -	Chiner-badam têl.	Arachis hypogœa.	0·9242	33–43	A substitute for olive oil in all its various applications. Will scarcely congeal at 10 C°, and can therefore be substituted for Colza oil. Does not soon get rancid.
4,802	252	Indrajab seed oil	Indrajab têl	Wrightia antidysenterica.	—	10	A novelty. An excellent vermifuge.
4,803	253	Linseed oil -	Tisi têl -	Linum usitatissimum.	0·9347	27	
4,804	254	Mustard seed oil	Kala-sarisha têl.	Sinapis nigra	0·9160	33	In universal use among the natives of Bengal both for culinary purposes and as an unguent.
4,805	255	Nim seed oil -	Nim têl -	Azadirachta indica.	—	10	Used as a specific emollient in cutaneous disorders.
4,806	256	Poppy oil - -	Postar têl -	Papaver somniferum.	0·9243	50	Used chiefly to adulterate the better qualities of medicinal, culinary, and unguental oils.
4,807	257	Sunflower seed oil	Surya-mukhi phuler têl.	Helianthus annuus, et perennis.	0·9262	10	A limped bland oil suitable as a substitute for olive oil.
4,808	258	Til oil - -	Tiler têl -	Sesamum orientale.	0·9253	40	The basis of all the scented oils used in India. Does not soon get rancid. A good substitute for olive oil.
4,809	259	- - - -	Sor Gujah têl	- - -	—	25	A cheap oil extensively used to adulterate mustard oil.

A Collection of Materia Medica (officinal in the Pharmacopœia of India), from the India Museum (London).

3,340*a*. Cutch. Acacia catechu.
3,341. Bikh. Aconitum ferox.
3,342. Atees. Aconitum heterophyllum.
3,344. Aconite or Monkshood. Aconitum napellus.
3,346. Bael. Ægle marmelos.
3,347. Socotrine Aloes. Aloe socotrina.
3,348. Barbadoes Aloes. Aloe vulgaris.
3,349. Satween Bark. Alstonia scholaris.
3,350. Pyrethrum root. Anacyclus pyrethrum.
3,351. Cocculus indicus. Anamirta cocculus.
3,353. Dill seed. Anethum graveolens.
3,354. Common chamomile. Anthemis nobilis.
3,354*a*. Ground nuts. Arachis hypogœa.
3,355. Deadly nightshade. Atropa belladonna.
3,356. Margosa tree. Azadirachta indica.
3,356*a*. Myrrh. Balsamodendron myrrha.
3,357. Indian Barberry. Berberis asiatica.
3,358. Bengal kino tree. Butea frondosa.
3,359. Bonduc nuts. Cæsalpinia (Guilandina) bonducella.
3,362. Camphor. Camphora officinarum.
3,363. Ganza. Cannabis sativa.
3,363*b*. Carraways. Carum carui.
3,364. Adjuvan. Carum (Ptychotis) ajowan.
3,364*a*. Cloves. Caryophyllus aromaticus.
3,365. Senna. Cassia lanceolata.
3,366. Alexandrian senna. Cassia acutifolia.
3,367. Cassia fistula. Cassia (Cathartocarpus) fistula.
3,368. Yellow cinchona. Cinchona calisaya.
3,369. Pale cinchona. Cinchona condaminea.
3,370. Red cinchona. Cinchona succirubra.
3,370*a*. Cinnamon. Cinnamomum zeylanicum.
3,371. Pareira brava. Cissampelos pareira.
3,372. Colocynth. Citrullus colocynthis.
3,373. Sweet orange tree. Citrus aurantium.
3,375. Lemon peel. Citrus limonum.
3,376. Hemlock. Conium maculatum.
3,377. Mishmee teeta. Coptis teeta.
3,377*a*. Coriander seed. Coriandrum sativum.
3,379. Saffron. Crocus sativus.
3,380. Purging Croton. Croton tiglium.
3,381. Cubebs. Cubeba officinalis.
3,381*a*. Turmeric. Curcuma longa.
3,382. Thorn apple seed. Datura alba.
3,383. Thorn apple. Datura stramonium.
3,384. Purple foxglove. Digitalis purpurea.
3,385. Gaub fruit. Diospyros embryopteris.
3,386. Cardamoms. Elettaria cardamomum.
3,386*b*. Gum galbanum. Ferula galbaniflua.
3,387. Fennel seed. Fœniculum panmorium.
3,387*a*. Gamboge. Garcinia morella.
3,387*b*. Mysore gamboge. Garcinia pictoria.
3,387*c*. Cocum oil. Garcinia purpurea.
3,388. Liquorice. Glycyrrhiza glabra.
3,388*b*. American cotton. Gossypium barbadense.
3,388*c*. Cotton. Gossypium herbaceum.
3,388*d*. Ceylon moss. Gracilaria lichenoides.
3,389. Chaulmoogra. Gynocardia odorata.
3,390. Indian sarsaparilla. Hemidesmus indicus.
3,391*a*. Pearl barley. Hordeum distichon.
3,392. Indian pennywort. Hydrocotyle asiatica.
3,393. Khorasunee seed. Hyoscyamus niger.
3,394. Aniseed. Illicium anisatum.
3,395. Calumba root. Jateorhiza columba.
3,396. Juniper. Juniperus communis.
3,396*a*. Linseed. Linum usitatissimum.
3,397. Cowage. Mucuna pruriens.
3,397*a*. Nutmeg. Myristica officinalis.
3,397*b*. Tobacco. Nicotiana tabacum.
3,398. Cheeratah. Ophelia chirata.
3,398*a*. Pooloot. Oryza sativa.
3,399. Red poppy. Papaver rhœas.
3,400. Opium. Papaver somniferum.
3,401. Poppy capsules. Papaver somniferum.
3,402. Kala dana. Pharbitis nil.
3,402*a*. Pepper. Piper nigrum.
3,403. Esubgool seed. Plantago ispaghula.
3,403*a*. Gum rind. Pterocarpus marsupium.
3,404. Red sandal wood. Pterocarpus santalinus.
3,405. Pomegranite. Punica granatum.
3,405*a*. Galls. Quercus infectoria.
3,406. Castor oil seed. Ricinus communis.
3,408. Kamala. Rottlera tinctoria.
3,409*a*. Sugar. Saccharum officinarum.
3,410. Brown mustard seed. Sinapis juncea.
3,412. Nux vomica. Strychnos nux-vomica.
3,413. Tamarind. Tamarindus indica.
3,414. Dandelion. Taraxacum dens-leonis.
3,415. Guluncha. Tinospora cordifolia.
3,416*a*. Wheat. Triticum vulgare.
3,417. Untomool. Tylophora asthmatica.
3,417*a*. Catechu. Uncaria gambir.
3417*c*. Ginger. Zingiber officinale.

Materia Medica (non-officinal), from India Museum, London.

3,652. Muenphul. Randia dumetorum.
3,701. Gokhurroo. Tribulus lanuginosus.
3,715. Amookoona root. Withania somnifera.

8,907, &c. A collection of medicinal substances from Burmah. Exhibited by the Local Committee.

A & B. Two samples of Cardamoms (*Elettaria cardamomum*) grown on the Tounand estate, situated on the western mountains of India, in the British Province of Coorg, elevation from 2,000 to 3,000 feet above the sea. Climate mild, but very wet for six months, from May to October. Fall of rain about 150 inches annually. Exhibited by the proprietor, Captain Ralph N. Taylor.

Medicinal Substances, exhibited by the Bengal Local Committee.

8,833. Ptychotis ajowan. Decca.
8,834. Capsicum minimum. Dacca.
8,835. Rala geera. Dacca.
8,838. Ptychotis involucratum. Dacca.
8,836. Trigonella fœnum-grecum. Dacca.
8,830. Coriander. Rajshahye.
8,831. Turmeric. Rajshahye.
8,832. Aniseed. Rajshahye.
8,829. Chillies. Rajshahye.
8,828. Ginger. Rajshahye.

Medicinal Substances, exhibited by the Bombay Local Committee.

5,907. Trigonella fœnum-grecum. Kattyawar.
5,954. Trigonella fœnum-grecum. Baroda.
5,956. Coriander. Coriandrum sativum. Baroda.
5,976. Trigonella fœnum-grecum. Baroda.
5,984. Jeera. Carum carui. Sattara.
6,046. Coriander. Coriandrum sativum. Dharwar.
6,085. Trigonella fœnum-grecum. Aden.
6,288. Coriander. Coriandrum sativum. Kolkapoor.
6,290. Trigonella fœnum-grecum. Kolkapoor.
6,067. Trigonella fœnum-grecum. Dharwar.

6,108. Amonum korarima. Aden.
5,228. Aloes. Aden.
847. Trigonella fœnum grecum. Indore.

Medicinal Substances from Sind.

393. Nappo (seed). Nymphæa pubescens. Lake Munchur, Sind.
398. Loonak jo beej. Rumex sp. Chalo Hindoo of Boobuc.
400. Nelumbium speciosum (seeds). Lake Munchur.
401. Fœniculum panmorium. Thuddoo Hindoo of Boobuc, Sind.
402. Cashnee. Cichoriumendivia. Dhoolano Hindoo.
403. Trigonella fœnum græcum. Thawur Hindoo.
404. Cuminum cyminum. Dhurmo Hindoo.
405. Coriandrum sativum. Thuddoo Hindoo.
406. Carrot seed. Daucus carota. Phagoon Hindoo.
407. Allium sativum. Lahoree Hindoo.
408. Nelumbium speciosum (root). Lake Munchur.
409. Lohr. Nymphæa pubescens (root). Lake Munchur.

Medicinal Substances from Berar.

815. Coriander. Coriandrum sativum.
816. Jira.
819. Ajivan. Ptychotis ajowan.
820. Raj geera.
822. Turmeric. Curcuma longa.
823. Garlic. Allium sativum.
824. Onions. Allium cepa.
825. Chillies. Capsicum sp.

Medicinal Substances from the N.W. Provinces, exhibited by the Local Committee.

994. Tikhur Kanda root.
995. Kali Misri.
996. Mahul Shahur.
997. Marbodth, alias Sahbramull.
998. Bhooi Ghussur root.
999. Kilchi Kanda root.
1,000. Semar Kanda root.
1,001. Bunsingarah.
1,002. Kapus Kanda root.
1,003. Keo Kanda root.

360 Medicinal Substances from Amritsar, exhibited by the Local Committee.

3,493. Akalbir. Datisca cannabina.
3,500. Harmal. Peganum harmala.
3,497. Cuscuta reflexa.
3,494. Cupressus sempervirens.

Medicinal Substances from Oude, exhibited by the Local Committee.

2,577. Ajwan. Ptychotis ajowan.
3,580. Fennel. Fœniculum vulgare.
3,581. Coriander. Coriandrum sativum.
3,587. Ginger. Zingiber officinale.
3,595. Fenugreec. Trigonella Fœnum grecum.
3,601. Carraways. Carum nigrum.
3,610. Turmeric. Curcuma longa.

Specimens of the barks of Cinchona succirubra and Cinchona calisaya, mossed and unmossed, grown on the Neilgherries. Exhibited by Clements R. Markham, London.

Collection of specimens of Cinchona Bark grown in the Neilgherries. Exhibited by W. G. McIvor, Ootacamund.

1,476. Cinchona bark from Cinchona succirubra from trees 10 years old.
1,477. Cinchona bark from Cinchona succirubra, mossed bark.
1,478. Cinchona bark from Cinchona succirubra, renewed bark, 20 months old.
1,479. Cinchona bark from Cinchona succirubra, two years old.
1,480. Cinchona bark from Cinchona officinalis, var. crespilla, from trees 9 years old.
1,481. Cinchona bark from Cincona officinalis, var. crespilla, from trees nine years old.
1,482. Grey bark from Cinchona micrantha from trees 10 years old.

A collection of Cinchona bark from the India Museum, London.

Cinchona bark from Cinchona succirubra and Cinchona calisaya, grown in the Neilgherries, mossed and unmossed.

Cinchona bark grown at Kangra.

Cinchona bark grown at Darjeeling.

ANIMAL SUBSTANCES USED IN MEDICINE.

Dr. Kanny Loll Dey, Rai Bahadur, Calcutta.

4,624. Coccus cacti.
4,672. Leech. Hirudo sp.
4,673. Honey. Mel.
4,694. Meloe. Mylabris cichorii.
4,737. Polynemus plebeus. Sele muchi.

Surgeon G. Bidie, Madras.

1,592-3. Coccus lacca. (2 sorts.)

Amritsar Local Committee.

Specimens of 14 animal substances used as physic.

India Museum, London.

Hirudo (species).
Leeches. *Eng.* Aluk, Kheeraheen. *A.* Zeloo. *P.* Jaluka. *Sans.* Jonk. *Guz.; H.* Attei. *Tam.* Jalagh and Jerika. *Tel.* Patchet. *Malayalam.* Koodalla. *Cyr.* Calcutta.

Leeches are extremely abundant in Northern and Southern India, and are procurable, especially during the wet season or monsoon, in the neighbourhood of tanks and swamps. They are also bred by certain low caste Hindoos and Mussulmans to a considerable extent in the Deccan and other parts of India.

India Museum, London.

Mylabris (various species).
Blistering beetle. *Eng.* Sona-makhi. *H.* Telini, or Telee-mukhee. *B.* Vundoo-poochee. Madras.
7,015. Lytta sp.?
Blistering beetle. *Eng.* Munguldge, Assam.

These insects have long been used in Indian hospitals, as a substitute for the European *Cantharis vesicatoria*. They abound in many parts of India, and are very destructive to the species of Hibiscus, Roses, &c.

SECTION III.—FAT INDUSTRY.

A.—VEGETABLE AND ANIMAL OILS AND FATS.

A very large number of seeds contain fixed oil in sufficient quantity to remunerate for its extraction, some of these oils possess valuable medicinal properties, others are sweet and esculent, others again possess great drying properties, for which they are esteemed by painters and artists; whilst, on the other hand, some are so limpid as to be valuable for lubricating fine machinery. For different oils different uses, and all these varieties are well represented in India, but the native method of expression is so rude, being little better than a gigantic pestel and mortar, that one great desideratum towards the extension of Indian commerce in oils seems to be more efficient means for extraction, small, cheap, efficient, and simple oil presses for native use.

The exhibits of oils, both vegetable and animal, are exceedingly meagre, and give no idea of the resources of India in this section.

Collection of vegetable oils exhibited by Dr. Kanny Loll Dey, Calcutta.

4,792. Almond oil (Indian). Terminalia catappa. (Not a commercial article, occasionally used in preparation of food, but chiefly as a hair oil.)
4,793. Bassia oil. Bassia latifolia. (Extensively used for adulterating ghee, also for burning as a lamp oil.)
4,794. Cashew nut oil, kernel. Anacardium occidentale. (Use the same as 4792. Is as good as olive oil.)
4,795. Cashew nut oil, crust. Anacardium occidentale. (Used medicinally as a rubefacient.)
4,796. Castor oil. Ricinus communis.
4,797. Chalmugra seed oil. Gynocardia odorata. (Used extensively as an emollient and specific curative in leprosy; the specimen forwarded is less clear than can be obtained in the summer months. The seeds procurable in the cold weather will not yield a clear oil.)
4,798. Cocoanut oil. Cocos nucifera. (Expressed from the freshly dried kernal.)
4,799. Cotton seed oil. Gossipium herbaceum. (An excellent drying oil.)
4,800. Fennel seed oil or Kalajira oil. Nigella sativa. (An excellent lactagogue, used also for confections.)
4,801. Ground nut oil. Arachis hypogœa. (A substitute for olive oil in all its various applications, will scarcely congeal at 10 C, and can therefore be substituted for colza oil. Does not soon get rancid.)
4,802. Indrajab seed oil. Wrightia antidysenterica. (A novelty; an excellent vermifuge.(
4,803. Linseed oil. Linum usitatissimum.
4,804. Mustard seed oil. Sinapis nigra. (In universal use among the natives of Bengal, both for culinary purposes, and as an unguent.)
4,805. Nim seed oil. Azadirachta indica. (Used as a specific emollient in cutaneous disorders.
4,806. Poppy oil. Papaver somniferum. (Used chiefly to adulterate the better qualities of medicinal, culinary, and unguental oils.)
4,807. Sunflower seed oil. Helianthus annuus et perennis. (A novelty; a limpid bland oil suitable as a substitute for olive oil.)
4,808. Til oil. Sesamum orientale. (The basis of all the scented oils used in India, does not soon get rancid, a good substitute for olive oil.

Exhibited by Khetter Mohun Bysack and Sons, Nundon Bagan Steam Oil Factory, Calcutta.

4,810. Cocoa nut oil. Cocos nucifera.
4,811. Castor oil. Ricinus communis.

The Nundon Bagan Steam Oil Factory has the patent oil-press and mills of the late Babu Khetter Mohun Bysack, which are worked by a steam engine of 16 H.P. From 500 to 600 gallons of castor oil, and from 200 to 250 gallons of cocoanut oil can be prepared daily by these mills. The present firm consists of the sons of the late proprietor, whose trade mark K.B. upon their cases and tins is well known to European merchants.

Collection of vegetable oils exhibited by the Indore Local Committee.

908. Teel seed oil. Sesamum orientale.
909. Linseed oil. Linum usitatissimum.
910. Moongphullee. Arachis hypogœa.
911. Poppy seed oil. Papaver somniferum.
912. Rumeylee oil. Guizotia oleifera.
913. Sursoo oil. Sinapis sp.
914. Castor oil. Ricinus communis.

Collection of vegetable oils from Oude, exhibited by the Local Committee.

4,140. Sinapis glauca.
4,141. Linum usitatissimum.
4,142. Sinapis nigra.
4,143. Sesamum orientale.
4,144. Ricinus communis.
4,145. Papaver somniferum.
5,146. Bassia latifolia.
4,147. Sesamum orientale.

Three samples of vegetable oils exhibited by the Bombay Local Committee.

7,301. Khurasnee seed oil.
7,302. Mustard seed oil.
7,303. Sesame seed oil.

OIL CAKE.

The following examples of oil cake from Oude are exhibited by the Local Committee.

3,589. Linseed oil cake.
3,622. Mowha oil cake.
4,148. Mustard seed oil cake.
3,570. Poppy seed oil cake.
3,594. Surson seed oil cake.

ANIMAL OILS AND FATS.

India Museum, London.

Ghee.
Gritthum. *Sans.* Ghee. *H.; Guz.* Roghun. *P.* Rúgh. *Sar-i-kuli.* Neyee. *Tam.* Madras.

Ghee, or clarified butter, is produced generally from the milk of buffaloes, and is universally used in native cookery. As an article of commerce, ghee possesses some claim to importance, many thousands of maunds being sent every season from some of the grazing districts to the more cultivated parts, especially to the western provinces. It is generally conveyed in dubbahs, or bottles made of green hide.

Bombay Committee.

Ghee from Nassick.

India Museum, London.

Shark's liver oil. *Carcharias melanopterus.*
White Shark's liver oil. Tellicherry.
Ditto. ditto.

Fish liver oil is now generally employed in the Government medical departments in lieu of the cod-liver oil, and is prepared in large quantities on the western and Malabar coasts both for home use and exportation. The oil is manufactured from the livers of sharks, saw-fishes, cat-fishes, and some species of ray-fishes. The sharks are mostly obtained during October and November, when sardines are plentiful, the fishing being carried on in the deep sea from 4 a.m. until sunset, and putrid beef or porpoise flesh used on the hook, which is attached by a chain to the line. Nets are not used, owing to the large size of the fish from which the best livers are obtained.

B.—PRODUCTS OF FAT, &c.

Under this sub-section is included stearine, soap, candles, and other manufactures from fatty substances, exhibited by Baloo Moodelliar, Madras. Samples of manufactured soap :—

2,146. Illipi oil soap.
2,147. Castor oil soap.
2,148. Cocoanut oil soap.

SECTION V.

B.—DYE STUFFS, MINERAL AND ORGANIC.

India produces a large variety, and amongst them the most valuable of organic materials for the use of the dyer. Those which are not indigenous have been introduced with success, and when we name indigo, cutch, madder, sappan wood, safflower, mangrove bark, nut galls, myrabolans, and many others, it will be judged that our "Empire in the East" has great resources in dye stuffs. The collections sent to the present Exhibition are neither large nor numerous (indigo itself being almost unrepresented), but they are useful as an indication of the resources at command.

Six specimens of dyes, exhibited by Dr. G. Bidie, Madras.

1,583. Munjeet. Rubia munjista.
1,584. Kaniala. Rottlera tinctoria.
1,585. Pupli chucka. Ventilago maderaspatana.
1,586. Turwar. Cassia auriculata.
1,588–9. Turmeric. Curcuma longa.

A Collection of Dye Stuffs from the Bangalore Central Prison, Mysore.

No. I.—Woollen Dyes.

No.	Colours.	Material or Stuffs obtained from.	Remarks.
1	Blues - - - -	Indigo.	
2	Yellow - - - -	Turmeric.	
3	Red - - - -	Saunder's wood and lac.	
4	Browns - - - -	Popli Chukka.	
5	Orange - - - -	By mixing the primitive colour stuffs.	
6	Purple - - - -		
7	Green - - - -		
8	Rose and Magenta - -	Aniline dye.	
9	Crimson and dark red - -	Red wood and lac.	
10	Scarlet - - - -	Red wood and tin mordant.	

No. II.—List of Dye Stuffs and Materials used.

No.	Name.	Colours obtained.	How used.
1	Indigo - - - - *Indigofera tinctoria.* Neeli. (Vernacular or Kanarese.)	Blue and its shades—green, purple, and black.	Maceration in solutions.
2	Turmeric - - - - *Curcuma longa.* Arashina. (Vern. or Kanarese.)	Yellow, orange - -	Boiling with alum mordant.
3	Saunder's wood - - - *Pterocarpus santalinus.* Patanga. (Vern. or Kanarese.)	Red, crimson, scarlet, orange, purple.	Boiling with alum or tin.
4	Poras flower - - - *Butea frondosa.* Mutugada Huvvu. (Ver. or Kan.)	Yellow, green, orange -	By steeping in, with the addition of little soda turns to orange.
5	Lak. (*Coccus lacca.*) - - Aragoo. (Vern. or Kanarese.)	Red, crimson, scarlet -	By steeping.
6	Log wood - - - - *Hœmatoxylon campechianum.* (Vernacular or Kanarese.)	Red, black - -	By boiling.
7	Casan leaves - - - *Memecylon tinctoria.* Ulli yela. (Vern. or Kanarese.)	Used in red colours -	Boiling with alum.
8	Tugra seeds - - - *Cassia tora.* Thungadi beeja. (Vern. or Kan.)	Blue - - -	As an adjunct to green and yellow.

No. III.—Silk, Dye Stuffs.

9	Suringee - - - - *Calysaccion longifolium.* Suringee. (Vern. or Kanarese.)	Red, crimson - - -	With two parts of pesti pods by boiling.
10	Kamala powder - - - *Rottlera tinctoria.* Kapila podi. (Vern. or Kanarese.)	Red, rose, pink, orange -	By boiling.
	Do. do. - -	Blue - - -	Bleached silk, by maceration in cold solution of indigo.
	Do. do. - -	Black - - -	Steeping again with alum and iron mordants.
	Do. do. - -	Greens - - -	Yellow thread steeped in indigo solution.
11	Safflowers - - - - *Carthamus tinctorius.* Kusumba. (Vern. or Kanarese.)	Yellow, pink - -	Red thread steeped in indigo solution.

No. IV.—Cotton Dye Stuffs.

12	Indian madder - - - *Rubia Munjista.* Munjustee. (Vern. or Kanarese.)	Pink, crimson, lake, and orange.	Native dyers use commonly for red colour by boiling with alum in Madura side.
13	Chay root - - - - *Oldenlandia umbellata.* Chiriveru. (Vern. or Kanarese.)	Red, orange, and purple -	Very extensively used for red dye by the native dyers. Madras red handkerchiefs and Madura red cloths are specimens. The process varies to some extent in obtaining the evanescent and permanent colours.

No.	Name.	Colours obtained.	How used.
14	Morinda bark - - - *Morinda umbellata.* Maddi chukka. (Vern. or Kan.)	Red; the colour is dull, yet it is considered faster than the brighter colours obtained from other substances. The best dye is procured from the bark of the roots of trees, three years old.	By boiling with milk hedge ashes.
15	Popli stem - - - *Ventilago maderaspatana.* Popli chukka. (Vern. or Kan.)	Brown - - -	The bark of the root is used also for orange dye. With chayroot it forms rich chocolate colour, and with galls black. By boiling and steeping with or without alum.
16	Myrobolan - - - *Terminalia chebula.* Alalakai. (Vern. or Kanarese.)	Used with other stuffs to get yellow and black.	By maceration and boiling. These three kinds of myrabolans yield, with alum, a good durable yellow, and with salts of iron a black colour. Commonly used for tanning purposes.
17	Babool bark - - - *Acacia Arabica.* Moogali chuckkay. (Ver. or Kan.)	Buff, fawn - -	By boiling.
18	Indigo seeds - - - Tarótéké beenj. Tagasibeeja. (Vern. or Kanarese.)	An adjunct for blue dye.	
19	Annotto - - - - *Bixa orellana.* Rangamalkai. (Vern. or Kan.)	Yellow.	
20	Cassia flowers - - - *Cassia auriculata.* Auvarikay huvu. (Vern. or Kan.)	Blue - - -	An adjunct for yellow dye.
21	Mara manjil - - - *Coscinium fenestratum.* Marada arashna. (Vern. or Kan.)	Yellow.	
22	Cochineal - - - - *Coccus cacti.* Kiramanjihula. (Vern. or Kan.)	Red, scarlet.	

874. Turmeric. Curcuma longa. Indore.
875. Aal. Morinda citrifolia. Indore.
822. Turmeric. Curcuma longa. Berar.
3,621. Aomla. Emblica officinalis. Oude.
3,610. Turmeric. Curcuma longa. Oude.
993. Kussoom. Carthamus tinctorius. Nagpur.

Exhibited by Local Committee, Amritsar.

3,475. Six specimens of dye stuffs used as physic by the natives.
3,471. Am chur. Slices of unripe mango, dried; used as a mordant to brighten colour.
3,493. Akalbir. Datisca cannabina.
3,494. Maji. Cupressus sempervirens.
3,495. Bojgand. Pistacia galls.
3,496. Amla. Emblica officinalis.
3,497. Akas bel. Cuscuta reflexa.
3,499. Kamala. Rottlera tinctoria.
3,472. Kusumba. Carthamus tinctorius. Kangra.
3,473. Kesu. Butea frondosa. Kangra.
3,474. Toon. Cedrela toona. Kangra.

Collection of Mineral and Organic Dyes. Exhibited by the Local Committee, Amritsar.

3,443. Asbarg. Stalk of a species of Delphinium.
3,444. Zangár. Sub-acetate of copper.
3,445. Náspál (rind of pomegranite). Punica granatum.
3,446. Guti hársingár. Nyctanthes arbortristis.
3,447. Guti kesú. Butea frondosa.
3,448. Bakam. Cæsalpinia sappan.
3,449. Kusumba. Carthamus tinctorius.
3,450. Máin. Galls on tamarisk.
3,451. Hartál (orpiment). Sulphate of arsenic.

3,452. Kishta. Pyrus communis.
3,453. Gerú.
3,454. Haldí. Curcuma longa.
3,455. Káhi safed. Sulphate of iron.
3,456. Káhi syah. Sulphate of iron.
3,457. Nil (indigo) from Khurja. Indigofera tinctoria.
3,458. Nil (indigo) from Multan. Indigofera tinctoria.
3,459. Lák dáná. Stick lac.
3,460. Kurin dáná. Cochineal.
3,461. Khún syah woshan (dragon's blood). Resin of Pterocarpus draco.
3,462. Peorí.
3,463. Haldi Chamá.
3,464. Majith.
3,465. Menhoi, or hana. Lawsonia inermis.
3,466. Vasmá.
3,467. Dhawá ká phúl. Grislea tomentosa.
3,468. Rúlyá. Rottlera tinctoria.
3,469. Ushná (a lichen).
3,470. Harir. Terminalia citrina.
3,810. } Aal root, Morinda citrifolia, with cloth dyed
3,811. } therewith, from Jaloun.
3,812. }

The principal trade of Kotra in the Jaloun district is in the dye from Aal (Morinda citrifolia). The best soils for Aal are,—

Mar	-	Black soil.
Kabur	-	Ditto, with more clay.
Peroa	-	A reddish sandy soil.

The rate per acre is,—

Mar	-	-	Rs. 2	8	0
Ditto	-	-	2	0	0
Kabur	-	-	1	0	0
Ditto	-	-	0	12	0
Peroa	-	-	0	8	9

The seed of the Aal is sown in July. The land is first ploughed, then raked by the native harrow called *bakkar*.

The seed is then sown broadcast, to one beegah of land one maund of seed is given. The plant begins to show in one month, or in August.

It is weeded in September, October, and November following.

In the following July the soil round the young plants is turned up to allow them to grow and receive the rains.

The second year it flowers in August and September. The flower is white and sweet-smelling. The yield per beegah of seed is in the first year about 20 seers, and the two following years only 10 seers. The third year the plant is dug up. The roots go down about three feet. All other parts of the plant are of no use.

The roots are dug up in December, January, February, as may be required. The yield in roots per beegah is five maunds.

The roots are divided into three distinct sorts:—

1st. The best is the thinnest, called *bhárá;* found at the greatest depth. The yield is about one maund, valued at Rs. 8 per maund in the market; formerly it fetched Rs. 20 per maund. (No. 3,810.)

2nd. The next size is called *jhurrun*. The yield is about 2½ maunds per beegah. It now fetches in the market Rs. 4 per maund. It formerly sold at Rs. 10. (No. 3,811.)

3rd. This sort is thickest, is called *ghattea*. The yield per beegah is about 1½ maunds. It sells now at Rs. 8 per maund; formerly it fetched Rs. 9. (No. 3,812.)

The three sorts are mixed in the following proportions:—

1st sort	-	-	1¼ seers.
2nd do.	-	-	2 do.
3rd do.	-	-	3 do.

Then chopped up fine; then ground in a hard mill; and for each seer of root 2 ounces of alum are added. All are put into a vat holding 2½ maunds, or 28 gallons of water.

The cloth to be dyed is first washed. To one *than* (piece) of cloth, a quarter seer of castor oil and a quarter seer of fuller's earth (sujjee) are used, with four seers of water, in which it is well stamped upon by the cheepee (cloth-printer). The cost of this process by the cheepee is 3 pie per "*than*" of 8 yards.

In the root mixture above mentioned, fine *thans* of white country-made cloth called *pátul*, or fine *thans* of *mirkhani*, a better sort of cloth, are put, and allowed to remain for eight days. The cloth is moved up and down to make the dye equal throughout. After this the cloth is taken out, washed, and dried in the sun, and pressed.

The present market price of *pátul* is Rs. 1–8–0 per *than* of 87 yards, *mirkhani* is Rs. 2 per *than*. A profit of 2 annas per *than* is generally made in the markets of Hatrass, Pilibheet, and Lucknow. These cloths are used by women as head-coverings.

The Trade of Syudnuggur, on the Banks of the Betwah, Pergunnah Oraie, District Jaloun.

The principal trade of this large village is carried on by dyers in dyeing a cloth called *zamoordi*. The price is Rs. 2–4–0 per *than* of 8 yards, used by women for petticoats. It is sent to every part of the north-west.

The colours are procured from the roots of the *notee*, a plant found in the jungles of Chutturpore in Bundelkhund. It gives the yellow colour.

From the flower of the *dawae*, a plant found in the same locality, it gives brilliancy to the red colour.

From the fruit of the *harrah*, found also in the same jungles, it furnishes a yellow colour.

A. H. Ternan, Colonel,
Deputy Commissioner.

A collection of dye stuffs from the India Museum, London.

2,994. Catechu. Acacia catechu.
3,012. Annatto. Bixa orellana.
3,016. Butea flowers. Butea frondosa.
3,020*a*. Marygold flowers. Calendula officinalis.
3,025. Safflower. Carthamus tinctorius.
3,031*a*. Mishmee teeta. Coptis teeta.
3,033. Turmeric. Curcuma longa.
3,034. Ispruck. Delphinium saniculæfolium.
3,044. Chay root. Hedyotis umbellata.
3,052. Indigo. Indigofera tinctoria.
3,052*a*. Green dye of Malda. Jatropha manihot.
3,060. Aal. Morinda citrifolia.
3,062. Mungkudu. Morinda umbellata.
3,064. Gambier. Nauclea gambir.
3,065. Oom-tari. Nipa fruticans.
3,066. Hursinghar. Nyctanthes arbor-tristis.
3,067. Rutton. Onosma emodi.
3,068. Chulcheleera. Parmelia kamtschadalis.

3,075. Pomegranate shells. Punica granatum.
3,086. Orchella weed. Roccella fuciformis.
3,088. Kamala. Rottlera tinctoria.
3,089. Munjeet. Rubia cordifolia.
3,090. Madder. Rubia tinctorum.
3,109*b*. Pupli chuckay. Ventilago maderaspatana.
3,110. Indigo. Wrightia tinctoria.
5,236. Madder from Aden. Bombay Committee.
5,237. Safflower. Carthamus tinctorius. Bombay Committee.
5,239. Henna. Lawsonia inermis. Bombay Committee.

A collection of dye stuffs specially prepared by Dr. Narajan Daji, Bombay.

6,839. Rubia munjista, from Malabar.
6,840, Rubia munjista, from Aden.
6,841. Rubia munjista, from Persia.
6,842. Morinda citrifolia, from Deccan.
6,843. Morinda tinctoria, from Sindh (1st sort).
6,844. Indigofera tinctoria, from Sindh (2nd sort.
6,845. Indigofera tinctoria, from Sindh.
6,846. Indigofera tinctoria, from Sindh.
6,847. Indigofera tinctoria, from Sindh.
6,848. Indigofera tinctoria, from Sindh.
6,849. Indigofera tinctoria, from Sindh.
6,850. Carthamus tinctorius, from Solapur.
6,851. Carthamus tinctorius, from Umrawatti.
6,852. Rottlera tinctoria.
6,853. Cæsalpinia sappan.
6,854. Dyed starch pigment.
6,855. Butea frondosa.
6,856. Bixa orellana or Kessar.
6,857. Crocus sativus.
6,858. Curcuma longa, from Barsi.
6,859. Curcuma longa, Rajapur.
6,860. Adenanthera pavonina.
6,861. Calysaccion longifolium, the flower buds, or Negkesur.
6,862. Pterocarpus santalinus or "Ruktachandan."
6,863. Delphinium sp.
6,864. Berberis aristata or "Daru Halad."
6,865. Onosma echioides.

Dye stuffs specially prepared by Dr. Narajan Daji, Bombay.

6,866. Roccella tinctoria.
6,867. Rockmoss, from Zanzibar.
6,868. Symplocos racemosa, from Zanzibar.
6,869. Grislea tomentosa or Dharphul, from Zanzibar.
6,870. Tamarix furas sp.
6,871. Pistacia vera sp.
6,872. Quercus infectoria or Majuphul.
6,873. Terminalia chebula or Herda.
6,874. Terminalia chebula or Himay.
6,875. Punica granatum.
6,876. Lawsonia alba or Mendi.
6,877. Tamarindus indica or Amlee chinch.
6,878. Acacia catechu or Kath.
6,879. Uncaria gambir.
6,880. Cinnamomum cassia D. or "Darchini."
6,881. Cinnamomum cassia, the leaf, or "Tamal patra."
6,882. Cinnamomum cassia, the flower buds, or "Kala Nagkessar."
6,883. Acacia arabica or "Gound."
6,884. Acacia arabica.
6,885. Mangifera indica or "Ambosi."
6,886. Citrus bergamia.
6,887. Impure Carb. soda, vel, Papad Kham, from Sind, 1st sort.
6,888. Impure Carb. Soda, vel, Papad Kham, from Sind, 2nd sort.
6,889. Impure Carb. Soda, vel, Papad Khan, from Sind, 3rd sort.
6,890. Barilla or "Sajjikhar."
6,891. Country soap or sabr.
6,892. Salvadora indica, from Sind.
6,893. Alum from Cutch, or Phataki Chinai.
6,894. Alum from China, or Pastaki Chinai.
6,895. Arminian bole.
6,896. Sulphate of copper or mow choot.
6,897. Subacetate of copper or jungal.
6,898. Ferruginous earth unburnt.
6,899. Ferruginous earth.
6,900. Sulphate of iron. Hira Kus.
6,901. Coccus cacti, 1st sort.
6,902. Coccus cacti, 2nd sort.
6,903. Coccus lacca or Kadilak.
6,904. Lac dye, or Pothi alita.
6,905. 1. Madder. Red.
2. Morinda. Red.
3. Indigo. Blue.
4. Kaya. Black.
5. Cochineal. Red.
6. Isparak. Yellow.
6,906. 1. Kapila. Yellow.
2. Safflower. Scarlet.
3. Sappan wood. Currubia.
4. Ash. Grey.
5. Knot, dyeing black ground with red spots.
6. Knot, dyeing red ground with white spots.
7. Calico, fruit-green ground with yellow and red pattern.
6,907. 1. Calico, fruit-yellow ground with red pattern.
2. Blocks for calico printing.
3. Putty printing.
4. Dyeing in wood. Red.
5. „ „ Purple.
6. „ „ Ash-grey.
7. „ „ Ivory red.
6,908. Case containing 14 boards:—
No. 1. Board containing 5 specimens.
2. „ „ 12 „
3. „ „ 15 „
4. „ „ 10 „
Coloured prints on Silk.
5. „ „ 16 „
6. „ „ 13 „
Of Knot.
7. „ „ 16 „

Of Knot dyed Silk, similar in style to those on board No. 6.

8. Board containing 16 specimens out of 64 specimens, being a series of samples of dyed calico in various colours.
9. Do. do.
10. Do. do.
11. Do. do.
12. Board containing 5 specimens of Putty-printed clothes used by Hindu ladies.
13. Board containing 14 specimens of fruits in metallic leaf, executed in Bombay.
14. Board containing 13 specimens, 9 of which illustrate dyeing in wool, and the remaining 4 in ivory.

INDIGO.

Indigofera tinctoria.

The history of the commerce of this substance would be eminently interesting, but it is not possible to enter on the subject here; suffice it to say, that on its first introduction into Europe it was almost driven out by the bitter intolerance of persons whose object was to prevent the old-fashioned *woad* (then in use as much as indigo is now) from being driven out before it. In 1557, at Frankfort, it was denounced by the Germanic diet as the "devil's dye," and its use forbidden. The prohibition was repeated in 1603; and as late as 1654, by imperial edict at Ratisbon, the proscription was enforced. In England an Act was made in Elizabeth's time, authorising the seizure and destruction of the offensive substance, as well as the detention of persons possessing it. The Act continued in force till the reign of Charles II., and "Brazil wood" shared the odium with it.

Indigo is known to chemists under two forms—white indigo (indigogene) and blue indigo, the latter being only an oxydized state of the former. The blue colour is entirely due to the oxygen, or at least comes to the substance as it gets access to the oxygen of the air; this is observable in the vats. When the fermented liquor or infusion of the plant first ferments with the appearance of whitish grey bubbles, afterwards these become blue, and finally a deep metallic lustred purple red. Dyed cotton, when just taken out of the dyeing vat, appears green, but rapidly assumes its deep blue tone from contact with the air. Blue indigo is perfectly insoluble in water, but it is found that it is so only so long as it retains its excess atom of oxygen. If it can be induced to part with that, the remaining indigogene is soluble in an excess of sulphate of lime, or rather alkali. Hence, for cotton dyeing, the vat is prepared by grinding up a quantity of indigo with water to the consistency of cream, and then mixing it with copperas and an excess of lime or alkaline water. The oxygen of the indigo then combines with the protoxide of iron in copperas to form oxide, and then the deoxidized indigo readily combines with the lime water, forming a yellowish green liquid, into which the fabric to be dyed is plunged; and then, on being taken out and exposed to the air, the oxygen returns to the solution with which the fabric has been saturated, and the deep blue is restored and becomes permanent without the use of any mordants. The dye applied in this manner is used cold. According to the plan adopted by native dyers, "chunám," "sajji" (crude potash), and "gurh" (molasses), form the solvent and deoxidizing agents; otherwise the process is identical. They do not use copperas, though they have it in plenty in the form of "lúra kasís," or "kalú safed." Wool and silk are not dyed in this way, but in another manner, taking advantage of another property of indigo. Pure indigo is soluble in sulphuric acid, but the solution is thick and black. This has been called *cæruleo sulphuric acid, sulphindylic acid*, &c. ("murabba" in Urdú), because it has the nature of both the indigo and the acid, neither undergoing the slightest change in itself. This latter substance is not a sulphate of indigo, that would imply a chemical combination between the acid and the dye, and the formation of a new substance, but it is not so. The acid and indigo combine, but neither is changed. This solution is capable, however, of destruction by an excess of caustic alkali, and turns by it to a yellow colour, from which nothing will restore it.

This sulphindylic acid is principally employed in dyeing wool and silk, and the excess acid is removed by washing in alkali.

Chemically pure indigo is of specific gravity 1·50, and possesses neither taste nor smell; it is a substance "indifferent," having neither acid nor basic properties. Good indigo is known by its fine purple blue colour, and by its fracture, which when rubbed with a hard smooth substance exhibits a coppery red lustre. No remarks need here be added on the manufacture of indigo. The ordinary processes of fermentation, of drawing off the liquor, of beating, and of collecting the "fecula," or precipitate of indigo from the liquor and pressing it, are universally well known, and are followed with but trifling variations in different provinces and different manufactories.

The main points appear to be, the watching the soaking plants so as to be able to tap off the infused liquor exactly at the right point of fermentation, and next, to beat the liquor in the second vat exactly long enough. No doubt in these points the native manufacturers in this province are as yet eminently deficient. Knowledge of these things can only be acquired by careful observation and long experience. Another point is, that the "fecula" is much improved, after being collected, by being boiled in copperas, and then pressed into its boxes.

Indigo manfactured by simply collecting the fecula, and dropping it down in cakes to harden in the sun, is termed "*gaud indigo.*"—(*Baden Powell's "Punjab Products.*"

826. Indigo. Local Committee. Berar.
1,587. Indigo. Dr. G. Bidie. Madras.
5,238. Indigo. Bombay Committee.
3,052. Indigo. India Museum, London.

ANIMAL DYES.

Bombay Committee.

63 & 64. Coccus cacti. (Two samples.)
65. Coccus lacca, or Kade lakh.
66. Lac dye, or Potti abta.

Mysore Local Committee.

109. Cochineal. Bangalore.

Jardine, Skinner, & Co.

3,648. Lac dye.

India Museum, London.

Peoree, or Puree (Indian yellow). Monghyr.

Amritsur Local Committee.

161. Peori, or Indian yellow.
158. Lak dana (lac dye).
159. Kirm dana (cochineal).

India Museum, London.

Lac dye. *Coccus lacca, Linn.* Komb-arruk, *B.* Mirzapore.
Do. Calcutta.
Do. Jubbulpore.
Do. Bengal.

The quantity of Lac dye exported from India during the official year 1871-2 was 23,236 cwts., valued at 8,14,450 Rupees.

C.—VARNISHES, SHELL LAC, SEALING WAX, &c.

Messrs. Schœne, Kilburn, & Co., Calcutta and Mirzapore.

7,818–7,820. Shell-lac, 3 sorts.
No. 1. A peculiarly fine quality, designated fancy Shell-lac, not manufactured as a commercial article.
No. 2. Technically known as H mark. Price at place of production Rs. 60 per maund of 82 lbs.
No. 3. Known by the mark V.S.O. Price Rs. 58 per maud.

Jardine, Skinner, & Co.

3,648. Shell-lac, Seed-lac, Yellow Seed-lac, and Reeree or refuse.

Surgeon G. Bidie, Madras.

1,592. Seed-lac.
2,172. Sealing wax.

India Museum, London.

Shell-lac. Mirzapore.
Do. Vizagapatam.
Do. Burdwan, Bengal.
Do. Buncoorah, Bengal.
Button-lac. Indore.
Seed-lac (Keree). Bhagulpore.
Grain-lac. Gangam.
Do. Vizagapatam.
Cake-lac. Calcutta.

Bombay Committee.

5,235. Sealing wax. Aden.

Mysore Local Committee.

114. Lac used in colouring toys. Bangalore.

India Museum, London.

Bees wax. *Apis sp.* Shuma, *A.* Siktha, *Sans.* Moom, *P.* Mome, *Guz.*, *H.* Melloogoo, *Tam.* Mainum, *Tel.* Lelin, *Malayalam.* La, *Chinese.* Miettie, *Cyn.* From Nagode.
Ditto Bimlipatam.
Ditto Travancore.
Bees wax. Coorg.
Ditto Pegu.
Ditto Pegu.

Quantity and value of Bees' Wax exported from India in the official year 1871–2.

From	Cwts.	Rupees.
Bengal	3,297	2,57,587
Burmah	12,898	60,887
Madras	2,551	1,87,716
Bombay	760	65,345
Sind	9	599
	19,515	5,72,134

D.—GLUE, ISINGLASS, &c.

India Museum, London.

Isinglass. *Eng.* Fishmaws. *T. N.* Palongpong-ikan, or Ari-ari-ikan, *Malays.* Loo-pa, *Chinese.* Sozelle; Fishmaw, small. *T. N.* Fish, Sozille. *T. N.* Singallee. *T. N.* Fish, Singally. *T. N.* From Bombay.
Ditto Calcutta.
Ditto Ditto.
Ditto Akyab.

Fishmaws are the swimming bladders or sounds extracted from the fish and dried in the sun. They are numerously prepared on the Malabar coast, and exported to Bombay, from whence large quantities are re-exported, principally to China and the Straits settlements.

Quantity and value of Fishmaws and Shark's Fins exported from India in the official year 1871–2.

From	Cwts.	Rupees.
Bombay	9,008	3,01,003

India Museum, London.

Glue. Sirrus., *H.*, *Guz.* From Ahmedabad.
Ditto Darjeeling.

Commissary of Ordnance, Cawnpore.

Glue and glue pieces.

GROUP IV.—SUBSTANCES OF FOOD AS PRODUCTS OF INDUSTRY.

SECTION I.—FLOUR AND OTHER FARINACEOUS PRODUCTS.

This section includes not only the meal and flour of cereals and pulse, but also all such farinaceous products as Arrowroot, Tapioca, Sago, &c., with their preparations. India has large resources in this section, which, unfortunately, are not represented by the exhibits.

Six Specimens of Flour &c. exhibited by His Highness the First Prince of Travancore.

2,173. Tapioca flour.
2,174. Kachil yam flour.
2,175. Banana flour.
2,176. } Rolong.
2,177. }
2,178. }

Exhibited by Mr. V. Fretwell, Khandeish.

6,245. Wheat flour.
6,248. Jowaree flour.
6,250. Bajree flour.

From the Government Bakery, Madras.

2,179. Soojee.
2,180. Soojee and flour.

Bombay Local Committee.

7,299. } Gram flour.
7,340. }

Oude Local Committee.

4,134. Oord flour. Kneaded with water and dried.
4,135. Moong flour Kneaded with water and dried.

Indore Local Committee.

903. Wheat flour.
904. Gram flour.
872. Singhara.

Bengal Committee.

7,821. Arrowroot from Faridpur.
7,822. Maida flour.
7,842. Komra bori. Pumpkin and dal. From Hugli.
7,843. Ful bori. A paste of bruised pulse. From Hugli.
7,844. Til bori. Sessamum and dal. From Hugli.
7,845. Matar bori. Preparation of peas and dal. From Hugli.

From Kashmere.

3,421. Singhara.

From Lake Manchur, Sind.

267. Booranee, the pollen of *Typha elephantina*.

This curious substance is employed as a meal for bread, although its source scarcely warrants its classification here. It is worthy of note that almost the same substance is employed for the same purpose by the natives of New Zealand.

SECTION II.—SUGAR, CONFECTIONARY, AND CHOCOLATE.

A.—SUGAR.

Largely derived in India from the sugar-cane, which is cultivated for that purpose, but also from the date palm and other palms, and such allied plants as *Nipa fruticans*.

Exhibited by Binny and Co., Madras.

2,192. Aska sugar.

Exhibited by Dr. G. Bidie, Madras.

2,193 to 2,196. Cane sugars.
2,197. Palmyra sugar. (*Borassus flabelliformis.*)

Local Committee, Surat.

7,324. Sugar.

H.H. the Guickwar of Baroda.

7,367. Sugar candy.
268. Goor, prepared at Sakra, Karachi, Sindh.
269. Moostee sugar do. do.

Exhibited by Carew and Co., Shahjehanpore.

4,176. Crystallized sugar.
4,177. Loaf sugar.

N.W. Provinces Committee.

4,178. Sugar candy.
4,179. Loaf sugar.

Indore Local Committee.

878. Molasses.

Oude Local Committee.

4,136. Sugar candy.
4,137. Sugar.
4,138. Molasses.
4,139. Goor.

The following are exhibited by the Bengal Committee.

7,832. Sugar, from Hugli.
7,834. Cane-juice molasses, from Chittagong.
7,833. Date-palm molasses, do.
7,835. Sugar-cane molasses, from Faridpur.
7,836. Date sugar candy, do.
7,837. Cane sugar, do.
7,838. Date-palm sugar, do.

The date tree is met with in almost every part of Bengal Proper, but it flourishes most congenially, and is found plentifully only in the alluvial soils which cover its south-eastern portion, excepting only such tracts as suffer entire submersion annually from the overflow of their rivers, as is common in portions of the Dacca, Mymensing, and Sunderbund districts. The extent of country best suited for its growth, and over which it is found most plentifully as above indicated, may therefore be taken as within an area stretching east and west about 200 miles, and north and south about 100 miles, and comprehending, by a rough estimate, about 9,000 square miles, within an irregular triangular space.

When not stunted in its growth by the extraction of its juice for sugar, it is a very handsome tree, rising in Bengal from 30 to 40 feet in height, with a dense crown of leaves spreading in a hemispherical form from its summit. These leaves are from 10 to 15 feet long, and composed of numerous leaflets or pinnules about 18 inches long. The trunk is rough, from the adherence of the bases of the falling leaves; this serves to distinguish it at a glance from the smooth-trunked cocoa-nut palm, which in its leaves only it resembles. The fruit consists more of seed than of pulp, and altogether is only about one-fourth the size of the Arabian kind brought annually to Calcutta for sale, and, when fresh imported, a rich and favourite fruit there. This inferiority of the Bengal fruit may no doubt be attributed to the entire neglect of its improvement there from time immemorial, and, perhaps, in some measure, to the practice of tapping the trees for their sap, so universally followed in the districts around Calcutta, its principal range of growth.

The process of tapping and extracting the juice commences about the 1st of November, and terminates about the 15th of February. Some days previously, the lower leaves of the crown are stripped off all round, and a few extra leaves from the side of the tree intended to be tapped. On the part thus denuded a triangular incision is made with a knife, about an inch deep, so as to penetrate through the cortex and divide the sap vessels; each side of the triangle measuring about six inches, with one point downwards, in which is inserted a piece of grooved bamboo, along which the sap trickles, and from thence drops into an earthen pot suspended underneath it by a string. The pots are suspended in the evening, and removed very early the following morning, ere the sun has sufficient power to warm the juice, which would cause it immediately to ferment, and destroy its quality of crystallizing into sugar.

The cutting being made in the afternoon, next morning the pot is found to contain, from a full-grown tree, 10 seers of juice, the second morning four seers, and the third morning two seers of juice; the quantity exuding afterwards is so small that no pot is suspended for the next four days.

Daily at sunrise, throughout the goor season, the industrious ryot may be seen climbing his trees, and collecting at a convenient spot beneath them the earthen pots containing the juice yielded during the past night. Under a rude shed, covered with the leaves of the date tree itself, and erected under the shade of the plantation, is prepared the boiling apparatus to serve for the goor season. It consists of a hole of about three feet in diameter, sunk about two feet in the ground, over which are supported by mud arches four thin earthen pans of a semi-globular shape, and 18 inches in diameter; the hole itself is the furnace, and has two apertures on opposite sides for feeding in the fuel, and for escape of the smoke. The fire is lit as soon as the juice is collected, and poured into the four pans, which are kept constantly supplied with fresh juice as the water evaporates, until the whole produce of the morning is boiled down to the required density. As the contents of each pan become sufficiently boiled they are ladled out into other earthen pots or jars, of various sizes, from five to 20 seers of contents, according to local custom, and in these the boiled extract cools, crystallizes into a hard compound of granulated sugar and molasses, and is brought to market for sale as *goor*.

The subsequent processes by which the goor is deprived more or less of its molasses and impurities are too long to be detailed.

Bangalore Local Committee.

115. Sugar candy.

1,006. Sugar cane, Pounda. Nagpur.
1,007. Sugar-cane, Kala. Nagpur.
1,008. Goor, Bheokhari. Nagpur.
1,009. Goor, Chul par. Nagpur.
1,010. Goor, Raghoonath. Nagpur.
1,011. Goor, Kala. Nagpur.

Amritsar Local Committee.

3,478. Ganna cane sugar.
3,480. Sugar candy.
3,481. Molasses.
3,482. Inferior sugar (Khand).
3,486. Misri bikanir.
3,488. Inferior sugar (Shakkar lal).
3,489. Sugar candy (Misri kuza).

3,490. Six specimens of sugar products used as physic by natives.

India Museum, London.

Honey from Goonah, C. India, Mysore, and Ava.

Of honey-bees there are several kinds common in India. One species (Apis sp.?) is kept in a semi-domestic state by the villagers along the N. W. Himalayas, and in Kumaon, Kashmir, &c., being hived in the walls of the house, small openings being made for their entrance, in the timbers of which the house is partially built. Many houses contain several hives, these consisting of an earthen pot or other receptacle contained in a small chamber in the wall, and having but a small external opening for the egress of the bees, but closed internally by a cover through which the honey is removed after the

bees are stupefied by smoke. The large wild bee (Apis dorsata), constructs its nest on the boughs of trees, making a comb about the size of the half of an ordinary cart wheel. It is common throughout India.

Rai Pritheeram Chowdry Bahadur, Zemindar of Mechpara.

Orange flower honey. "Komba Madu." Silhet.
Honey. "Madhu." Bhagulpore.
Honey comb. "Madu Chak." Gowalpore.

B.—CONFECTIONARY.

H.H. the Guickwar of Baroda.

7,349.	Sesamum	confectionary.	White.	Baroda.
7,350.	Do.	do.	Saffron.	„
7,351.	Do.	do.	Yellow.	„
7,352.	Do.	do.	Green.	„
7,353.	Do.	do.	Purple.	„
7,354.	Do.	do.	Red.	„
7,355.	Do.	do.	Red.	„
7,356.	Cloves and gourd confectionary		Yellow.	„
7,357.	Cloves	do.	White.	„
7,358.	Gourd	do.	White.	„
7,359.	Almond pieces	do.	White.	„
7,360.	Do.	do.	Saffron.	„
7,361.	Cucumber seed	do.	White.	„
7,362.	Cardamum	do.	White.	„
7,363.	Poppy seed	do.	White.	„
7,364.	Do.	do.	Saffron.	„

Mr. Javerilal Omiashunker.

7,265. Confectionary ornaments of different colours. Puna.

7,864. Sugar Drops. Chupra, Bengal.
7,865. Sugared cardamoms. Chupra, Bengal.

3,479. Sweetmeats. Elaichi dana. Punjab.
3,483. Sweetmeats. Tawe ki misri. Punjab.
3,484. Sweets. Khelonna Khand. Punjab.
3,485. Sweets. Khand. Punjab.
3,487. Sweets. Batasha. Punjab.

7,920. Sugar Balls. Burdwan.
7,921. Sugar Sweets. Burdwan.

283. Til comfits. Hyderabad.

8,143 to 8,153. A collection of painted plaster casts of platters on which models of confections are laid, moulded and painted by Heralal Das, Monomotho Mojumdar, Gopal Chunder Pal, and Harishchundra Khan, of Calcutta. Exhibited by the Bengal Committee.

[N.B.—The majority of these more or less broken in transit.]

C.—JELLIES AND PRESERVES.

This sub-section includes only such fruits, &c. as are preserved with sugar, or dry, and not pickles and sauces, which were adjudged separately.

Preserves exhibited by Dawun Choteer, of Haidarabad, Sind.

278. Alloobokhara (plum) preserve.
279. Mango. Mangifera indica.
280. Citron. Citrus medica.
281. Apple preserve.
282. Gujjur or Carrot.

Preserves exhibited by the Bengal Central Committee.

7,849. Tamarinds, from Moorshedabad.
7,850. Amsatta, Mango juice inspissated, from Moorshedabad.
7,851. Dried plums, from Moorshedabad.
7,852. Amshy, preserved mango, from Faridpur.
7,853. Dried mangoes do.
7,855. Tentul, Tamarinds do.
7,857. Sweet mango preserve do.
7,858. Bael preserve. Ægle marmelos, do.
7,867. Amlah Jalee, from Bhagulpur.
7,869. Coranda Jalee, do.

Preserves exhibited by P. Vencatachellum, Madras.

2,203. Preserved tamarind.
2,219. Guava jelly.
2,220. Mango jelly.
2,221. Wood Apple jelly.

Preserves exhibited by the Oude Local Committee.

4,149. Citron preserve.
4,151. Bael do.
4,152. Ginger do.
4,153. Mango do.
4,154. Tamarind do.
4,156. Orange do.
4,157. Pumpkin do.
4,159. Lime do.
4,160, 4,161. Citron do.

Preserves exhibited by Framji Nowroji, Bombay.

7,283. Mango fruit, for tarts.
7,284. Ripe mangoes.
7,285. Pine apple for dessert.
7,298. Roselle jelly.
7,299. Guava jelly.

Preserves exhibited by the Bombay Local Committee.

7,300. Preserved Aolas.
7,309. Preserved gooseberries.
7,310. 7,323. Preserved ginger.
7,311. Preserved tamarinds.
7,315. Roselle jelly.
7,317. Dried dates.

D.—TEA AND CHOCOLATE.

An exhibition of teas from localities other than the well-known ones in China possesses more than ordinary interest. There can be no doubt that tea will be extensively cultivated in India, land spread over a district exceeding 1,000 miles in length being more or less adapted to its growth. The production of Tea in Assam has taken very firm root, and is spreading with almost unexampled rapidity, although no samples were sent for exhibition. But the cultivation of tea is not confined to Assam; the Government of India having succeeded, through the able agency of Dr. Jameson, in introducing its cultivation into Dhera Dhoon, Kumaon, Gurhwal, and Kangra. As the result of this, private enterprise—as represented by a number of individuals and several companies—is now engaged in extending its cultivation in the districts in question, the Government still, however, continuing to foster its growth, not with the view to immediate pecuniary profit, but simply to encourage so important an article of commerce. In the Neilgherries also, the introduction of tea culture has proved a success.

Exhibited from the Curzon Estate, Kotergherry.

2,228. Dust tea.
2,229. Orange Pekoe.
2,230. Pekoe.
2.231. Gunpowder.

This latter is a small black tea, and not the green tea usually known by the name of Gunpowder.

C. Havelock, Esq., Thia Shola Estate, Ootacamund.

2,267. Pekoe.
2,268. Pekoe Souchong.

E. G. Brace, Esq., Kotergherry.

2,269. Pekoe.

J. G. Findlay, Esq., Kotergherry.

2,270. Neilgherry Tea.

Thos. Stanes, Coonoor.

2,271. Flowery Pekoe.

Mr. Rohde, Balmadies Estate, Ootacamund.

2,272. Neilgherry tea.

As long since as 1862, upwards of fifty tea plantations existed in Cachar, and some thousands of acres were under cultivation.

8,515. Pekoe Souchong. Cachar.
8,516. Pekoe. Cachar.
8,512. Congou. Cachar.
8,518. Broken leaf. Cachar.
8,514. Souchong. Cachar.
8,517. Broken pekoe. Cachar.
8,513. Broken Pekoe Souchong.

Both in Kumaon and Gurwhal, and the Deyrah Dhoon, Government plantations, as well as those of individuals and companies, are to be found. In the year 1861 alone, the Government distributed to private planters throughout Kumaon, Gurwhal, Deyrah Dhoon, and the Punjab upwards of 130 tons of seed, and 2,400,000 seedlings.

Kousanie Tea Company.

4,180. Orange Pekoe tea.
4,180. Pekoe.
4,180. Souchong.
4,180. Kousanie mixture.
4,180. Young Hyson.
4,180. Hyson.
4,180. Imperial.
4,180. Gunpowder.

The following information respecting the foregoing samples was furnished by the manager of the company:—

Probable value of the above samples in the London Market.

			s.	d.		s.	d.
Orange Pekoe	per lb.	from	3	0	to	3	6
Pekoe	„	„	2	10	„	3	4
Souchong	„	„	2	8	„	3	2
Kousanie mixture	„	„	2	6	„	3	4
Young Hyson	„	„	3	6	„	4	0
Hyson	„	„	3	0	„	3	6
Imperial	„	„	2	6	„	2	10
Gunpowder	„	„	2	4	„	2	6

Out-turn of Kumaon and Gurwhal season, 1872: 250,000 lbs.

Land tenure, "fee simple." Cost of manufacture, from 10 to 12 annas per lb. Number of hands employed on this garden, 350—half local and half imported from Nepaul. Remuneration, Rs. 4 per mensem for able-bodied men.

The exhibits have been manufactured by Luchee Chowdry, native of India, under the superintendence of H. McMaster, and are the produce of the season 1872.

Kuttyoor Tea Company, Kumaon.

4,181. Young Hyson.
4,181. Hyson. No. I.
4,181. Hyson. No. II.
4,181. Gunpowder. No I.
4,181. Gunpowder. No. II.
4,181. Imperial Gunpowder.

The probable value of the accompanying musters in the London market.

Young Hyson	per lb.	from	2	11	to	3	0
No. I. Hyson	„	„	2	10	„	2	11
No. II. Hyson	„	„	2	7	„	2	8
No. I. Gunpowder	„	„	2	4	„	2	6
No. II. Gunpowder	„	„	2	0	„	2	2
Imperial Gunpowder	„	„	1	7	„	1	8

Out-turn of the district for the season of 1872:

About 300,000 lbs.

Rental value of land:

Rs. 2-8 per acre of forest land buys in it fee-simple. Government rental on land is about, on the average, 12 annas per acre.

Cost of manufacture:

About from 8 to 10 annas per lb.

Number of hands employed on tea plantations in the district:

About 3,000 men and boys; of this number a part are imported from Nepaul, and the remainder are the indigenous inhabitants.

Remuneration:

Rs. 4 per mensem for able-bodied men.

The samples exhibited have been manufactured by Lee-kon-shew, Chinaman, tea maker, under the superintendence and direction of Norman F. T. Troup, Offg. Manager and Director.

The only two samples from the Kangra district are exhibited by the Local Committee of the Punjab, viz.:—

3,387. Black tea. Palampur. Kangra district.
3,388. Green tea. Palampur. Kangra district.
8,480. Pekoe, broken Pekoe, Congou, and Souchong withered in the shade, from Sylhet.
8,480*a*. Pekoe, broken Pekoe, Congou, and Souchong, withered in the sun, from Sylhet.
8,511. Brick tea, from Darjeeling.

The first trial of the tea plant at Darjeeling was made in 1841, with a few seeds grown in Kamaon from China stock. It was quite successful as to its growth, and the quality was approved of by the Assam tea planter who visited Darjeeling in 1846, and made the first tea here. The original plants are now to be seen. All are of gigantic size; one is a bush 50 feet in circumference and 20 feet high.

Nevertheless 7,000 feet, the elevation of Darjeeling, is too great for profitable planting; the frost kills the seedlings, and there is not a sufficiently rapid succession of leaf in the warm season to make the manufacture pay. At 7,500 feet the plant does not thrive at all. Elevations of 4,500 feet and under that to 2,000, are the best for tea, and from 3,000 to 1,200 feet will probably be found the best for coffee. Tea and coffee plantations at higher elevations than these may eventually come into occasional use to secure high flavoured produce without reference to profit.

Although experiments continued to be made on the growth of the tea plant, and seed from Assam and Kumaon was distributed gratuitously by Government, it was not till 1856 that the first plantation was started at Kursing, and another near Darjeeling, by Captain Samler, who was also the first to try coffee. The success in both cases has been complete, and others have followed in the same path. Indeed all that is now required is careful and liberal encouragement by the Government, to render these hitherto valueless mountains a rich and productive field for European enterprise, a profitable source of pleasant labour to the Hill tribes, and through these channels a source of strength and stability to our power.

The manufacture of tea in Darjeeling begins in April and ends in October. During the period twenty pickings of leaves are reckoned on. The tea of April, May, and October is the finest. The coffee is cured from October to January.

The number of tea plants per acre varies from 1,860 to 2,700, according as they are placed at 5 or 4 feet apart. The produce of tea per acre looked for from the first year of manufacture to the fourth or fifth, when a plantation is at maturity, cannot be correctly estimated. The produce per plant in the fourth year of age is variously estimated at ½ to 3 ounces. Captain Massan in a memorandum of his operations at Tuckvor, states "he got last season "from a few indigenous Assam plants grown at an "elevation of 5,000 feet above the sea one pound of "manufactured tea from each tree. The trees were "seven years old." This is an immense return, and not to be reckoned on, on a large scale.

Labour is still abundant, and is likely to continue so from the absence of demand in Eastern Nepaul, the great source of supply. The plantations give steady employment to about 3,000 persons, with extra hands occasionally. Wages of Coolies 4*s*. 8*d*. to 5*s*. per mensem.

Employment on tea and coffee is preferred to that on roads and buildings. Wages of manufacturing Coolies amount to 8 rupees per mensem; that of European assistants to from 100 to 150 rupees; of managers from 200 to 400, with house, &c.

8,481. Pekoe from Chittagong. W. Sarson.

Dr. Leitner, Lahore.

Specimen of Lhassa brick tea.

This tea is pressed in the form of a brick, and is prepared when used with butter and salt. It is preferred to all other teas by the natives of Central Asia and Tibet, but the supply has lately ceased with China on account of the recent wars with the Muhammadans of Yarkand.

SECTION III.—WINES, SPIRITS, &c.

Country liquor is distilled from either molasses, mowah fruit, or the two mixed together; that from molasses is preferred at Furruckabad, from whence the following notes are supplied by H. Blunt, Esq.

Molasses, or sheerah, when cheap, sells at Re. 1 per maund, and often rises to Rs. 4; now it is selling at Rs. 2–4.

Bark of acacia, 8 annas to Rs. 2–8.

The process for manufacturing the liquor is as follows:—Take five seers of refuse from the boiler after distillation, to which add two seers of bark of accacia in chips of two or three inches long, and one and one-half maunds of water, and allow these to ferment for a day and night in a large jar; the next day add thirty seers of molasses, and allow the whole to stand for two or three days; then stir up the mixture daily. In summer, after six or seven days the preparation is ready for distillation; in winter, in ten or twelve days. The whole is then thrown into the boiler, and with a brisk fire beneath in three hours the liquor is distilled. The way to test the "lahnn," or preparation, that it is ready for distillation, is to apply a flame to the mixture; if it burns like spirit it is ready, if not, it is restored to the jar for further fermentation. The above quantity would give from two and a half to three gallons of liquor but if the distillation is extended to four or five hours the liquor is weakened. The distillers prefer

to take the three gallons, without unnecessarily using fuel and paying the high duty, as the three gallons would admit of being weakened with water and sold to customers.

To make the liquor stronger a double distillation is necessary; the liquor is restored to the boiler and the fire is tempered.

The strength of the liquor varies from 20 per cent. above to 20 per cent. below London proof.

The charge for the sample sent, 1—7 per cent. above London proof, would be,—

Re. 1-8 per gallon Government still-head duty.
Re. 1-8 value of liquor sold by distiller to retail vendors.
Rs. 3-0

But the charge is regulated by distillers according to the price of molasses.

The retail vendors, having to pay license fees, sell at 12 annas per quart; but they are prepared to weaken and sell it at 10 annas, 8 annas, 7, and 6 annas per bottle.

The liquor is coloured with burnt sugar, or sandal-wood powder thrown into the receiving pot.

The liquor from the mowah fruit is not so strong as that prepared from molasses, and ferments by being kept long.

The original stove is built with unbaked bricks, fixed with clay cement, and the vat or tank with baked bricks set in lime mortar and plastered; the tank is filled with water. The holes on the stove are intended, one to drain off the refuse from the boiler after distillation, and the other holds a paste of clay. which, spread on cloth, is applied to the joining at the necks of the boiler and cover to prevent the steam from escaping.

Spirits exhibited by the Bengal Central Committee.

8,860. Rum. Albion Distillery, near Calcutta.
8,861. Doasta. Kidderpore Distillery.
8,862. Dobara liquor. Sudder Distillery at Bhaugulpore.

Exhibited by Carew and Co., Shahjehanpore.

74. Spirit.
75. Rum.
76. Moroha.

Sett, Atmaram, Pretumdas, and Co.

270. Jagree and date spirit.
271. Jagree spirit.
272. Mowra.
273. Seatsho.

The following Spirits from Surat were exhibited by the Bombay Local Committee.

9,122. Spirit. Doaksha.
9,123. Spirit. Foodoo.
9,124. Spirit. Falsa.
9,125. Spirit. Ajmo.
9,126. Spirit. Mhogro.
9,127. Spirit. Mozambie.
9,128. Spirit. Champelli.
9,129. Spirit. Game.
9,130. Spirit. Plain.
9,131. Spirit. Yelchee.
9,132. Spirit. Masala.
9,133. Spirit. Leaves, &c.

These are for the most part cane-spirit flavoured by the different substances which furnish their names.

Spirits exhibited by the Indore Local Committee.

915. Mowha spirit. Indore.
916. Sweet liquor. Indore.

The following Samples of Vinegar were contributed by the Bengal Central Committee.

7,839. Cane-juice vinegar. Shahabad.
7,840. Date-juice vinegar. Shahabad.
7,841. Common vinegar. Faridpur.

The samples were too small for adjudication.

SECTION IV.

B.—PRESERVED MEATS, FISH, &c.

Baloo Moodelliar, Madras.

2,232. Preserved fish roes. (Two dozen.)

P. Vencatachellum, Madras.

2,214. Tamarind fish. (Four jars.)

Madras Committee.

2,233. Preserved Kumblamoss fish.

D.—PICKLES AND CONDIMENTS.

Indian chutnies and Indian pickles have a wide reputation, which has been sustained by the samples forwarded to the present Exhibition.

Pickles and Sauces exhibited by Sapoorjee Framjee Wyeed of Karachi.

284. Lucknow chutney.
285. Mango do.
286. Delhi do.
287. Kashmere do.
288. Madras do.
289. Bengal do.
290. Sliced chutney.
291. Karachi sauce.
293. Essence of chilly.

Pickles and Sauces exhibited by Khamoo Nembhoo of Haidarabad, Sind.

294. Garlic pickle.
295. Ginger do.
296. Maha pickle (vegetable marrow).
297. Limes pickle.
298. Carrot do.
299. Potato do.

300. Onion pickle.
301. Bhendi do.
302. Gowar do.
303. Bhe do.
304. Radish do.
305. Brinjal or egg plant.
306. Mango pickle without oil.
307. Phalso pickle. (*Grewia Asiatica.*)
274. Dora do.
275. Soorun do. (Species of yam.)
276. Sulgam do. (Turnip.)
277. Mango do.

Pickles and Sauces exhibited by the Bengal Local Committee.

7,847. Lime pickle, Leburacha, from Hugli.
7,848. Mango pickle, Amchur, from Hugli.
7,854. Mango preserved in oil, from Faridpur.
7,856. Mango pickle, Kasundee, from Faridpur.
7,866. Lime pickle, from Bhagalpur.
7,868. Kurala chutney, from Bhagalpur.

Pickles exhibited by the Oude Local Committee.

4,150. Acid chutney.
4,155. Momordica charantia.
4,158. Onion pickle.
4,162. Mango pickle.
4,163. Mixed pickle.
4,164. Sweet chutney.

Pickles and Sauces exhibited by Framji Nowroji, Bombay.

7,286. Lemon pickle.
7,287. Sweet Lucknow chutney.
7,289. Mango chutney.
7,291. Mango pickle.
7,292. Mild chutney.
7,293. Delicious chutney.
7,294. Cachmere chutney.
7,295. Cachmere pickle.
7,296. Bengal chutney.
7,297. Ginger pickle.
7,320. Union sauce.
7,321. Tapp sauce.
7,290. Madras Mulligatawny paste.
7,288. Madras curry paste.

Pickles exhibited by the Bombay Local Committee.

7,301–7,306. Carrot pickle.
7,302, 3. Lemon pickle.
7,304. Gurmur pickle.
7,305. Rera or Dora pickle.
7,307. Sweet mango pickle.
7,308. Sliced ginger pickle.
7,312. Sliced cucumber.
7,313. Lemon pickle.
7,314. Cabbage pickle.
7,316. White berries pickle.
7,318. Girkiss pickle.
7,319. Onion pickle.
7,322. Green chillies.

Pickles and Sauces exhibited by P. Vencatachellum, Madras.

2,198. Stuffed mango pickle in vinegar.
2,199. Stuffed mango pickle in oil.
2,200. Minced mango pickle.
2,201. Hot mango pickle.
2,202. Sweet mango pickle.
2,204. Lime chutney.
2,205. Mango chutney.
2,206. Madras chutney.
2,207. Hyderabad chutney.
2,208. Lime pickle in oil.
2,209. Bamboo pickle in vinegar.
2,210. Lime pickle in vinegar.
2,211. Madras curry powder.
2,212. Curry paste.
2,213. Mulligatawny paste.
2,217. Cayenne sauce.
2,218. Tapp sauce.

7,296. Chilly powder. Bombay.
7,304. Hot spices mixed. Kutch.
7,305. Spices mixed. Kutch.

A.—CIGARS.

Exhibited by H.H. the First Prince of Travancore.

2,234. Cigars made from Manilla tobacco grown in Travancore.

Exhibited by Messrs. Campbell and Co., Dindigul, Madras.

2,235 to 2,242. Dindigul cheroots, Nos. 1 to 8.
2,243. Cigarettes.

Trichinopoly Cheroots exhibited by Major B. L. Forster, Trichinopoly.

2,244–5. Havannah-shaped.
2,246. Do. long.
2,247. Dawson's muster, with reeds and straws.
2,248. Dawson's muster, with straws only.
2,249. Thompson's muster, with reeds and straws.
2,250. Do. with straws.
2,251. Noble's muster, without straws.
2,252. Small Manner's muster, with straws.
2,253. Small breakfast size, with straws.
2,254. Medium Ogilvie's muster, with straws.
2,255. Noble's muster, with straws.
2,256. Grant Havannah-shaped cheroots.

Exhibited by Roberts and Co., Cocanada.

2,257 to 2,266. Lunka cheroots of 10 kinds.

7,862. Pika cigars. Balasore.
7,863. Kailah cigars. Chittagong.

B.—OTHER MANUFACTURES OF TOBACCO.

3,634. Tobacco pills. Oude.
7,860. Prepared tobacco. Faridpur.
7,861. Do. Balasore.

The following information accompanied the tobacco specimens from Benares :—

There are two kinds of tobacco for smoking, viz. :—plain and spiced tobacco. There are two kinds of plain tobacco also, sweet and strong. The plain tobacco is made from the leaves being mixed with molasses. Where a large proportion of molasses is put, it is said to be sweet tobacco; where a small proportion is given, it is called strong, or kurooa tobacco. In khumeerah, or seasoned and spiced tobacco, apple, plum, pine-apple, grapes, and jack

fruit are mixed with the sweet tobacco, and kept under ground or put into a jar, which is closed with clay paste. When it is well seasoned, the spices specified below are mixed with it, and it becomes khumeerah tobacco. In summer apple pickles are put with it, and keora and rose water are poured on the tobacco. In winter musk is mixed.

Spices:—

1. Naggur mootha, an odoriferous herb.
2. Kapoor kuchree.
3. Jai moosa, or jatamaseee.
4. Chureela.
5. Soogundh mantree.
6. Soogundh bala.
7. Soogundh kokila.
8. Tuj.
9. Taleese.
10. White sandal dust.
11. Panchree.
12. Small cardamom.
13. Large ditto.
14. Buckchee.
15. Cloves.
16. Nagasur.
17. Chumpaotee.
18. Kuchoor.
19. Tumbool.
20. Javitree, or mace.

Prepared snuff consists of tobacco only. Some mix with it uttur for scent.

Soortee, made from dried tobacco leaf. The people of Benares generally eat it with pan, or betel-leaf. There are two kinds prepared, viz., dry and wet. Dry soortee consists of dried tobacco leaves, chopped into small pieces, which are boiled till the water becomes thick, and some additional pieces of dry tobacco are put into it. Subsequently it is dried and becomes fit for use. The wet soortee is prepared by boiling the tobacco leaves and straining the water, which is made thick by boiling. In summer, camphor, cubebs, and keora are mixed in it. In winter musk and mace are applied.

C.—PREPARATIONS OF HEMP.

The dried leaves of bhang are sometimes smoked alone or mixed with tobacco; but the more common form of taking bhang is to make it up with flour into a cake, or a majún or sweetmeat, which has a green colour. There is also a common method for habitual drinkers of "banghí," viz., of infusing the leaves in cold water in a pestle and mortar, and pouring off the clear liquor through a cloth strainer.

The eating of these sweetmeats by persons unaccustomed to them produces the most violent mania and excitement, and the eyes become red and inflamed.

I recollect, says Baden Powell, at Lahore, a case of attempted suicide by a youth, where it appeared he had purchased sweetmeats which contained bhang, of which he was not aware; he had not even taken bhang before. After a time he became almost frantic, rushing wildly about hither and thither, and at last threw himself into a well, whence he was fortunately rescued; after this, he fell into a kind of heavy sleep or stupor and then recovered. Persons who are accustomed to the excitement of bhang are not usually so violently excited.

The common majún to be met with in the bazars is often merely sugar, perhaps with ghí, and the bhang without the other ingredients.

Specimens of Hemp preparations exhibited by the Amritsar Local Committee.

3,503–4. Majun Najjar.
3,505. Majun suranjan.
3,506. „ Mastagi.
3,507. „ Rahat.
3,508. „ Ramonya.
3,509. „ i-jalimus.
3,510. „ shahr-yar.
3,511. „ Khyar chamba.
3,512. Mommyai.

Two Specimens exhibited by the Bengal Local Committee.

7,914. Majun. Calcutta.
7,918. Maddat. do.

The principal forms in which hemp is met with in the markets of the East* are,—1, *haschich;* 2, *bhang;* 3, *gunjah;* 4, *churrus;* 5, a variety of electuaries, pastes, &c., in all of which butter or some other oleaginous matter is the basis of formation.

I. The first, or *haschich*, is the Arabian name given to the dried tops of the plant grown in Upper Egypt, the meaning of the word being "herb," or "*herbe par excellence;*" the tops are gathered some time before the seeds are come to maturity.

II. *Bhang* is an Indian preparation, consisting of the larger leaves and capsules, which, according to Dr. O'Shaughnessy, is the cheapest form used in India, and therefore in common use among the lower orders for smoking, &c.; from it is prepared an intoxicating drink, and it forms a part of the confection called majoon.

III. *Gunjah* is the chief Indian form of the dried plant, and consists of the dried tops of *cannabis* after flowering, and from which the resin of the leaves has not been removed; it is chiefly sold in the Calcutta bazaars for smoking, in bundles two feet long and three inches in diameter; the colour is dusky green, the odour agreeably narcotic, the whole resinous and adhesive to the touch. The specimens I have examined consist of a central stem with branches, round which are aggregated elongated oval masses about 1½ inches long, and closely pressed together by adhesive resinous matter; when steeped in water these masses can be teased out, and are found to consist of the tops of the plant, that is, the flowers, fruit, and smaller leaflets.

IV. *Churrus* is the resinous secretion alone, and is therefore the most powerful shape in which hemp may be used; but it is at the same time expensive, and is not met with in Europe, except as a museum specimen. The specimens in Dr. Christison's museum are variously-sized, nodulate, round masses from the size of a pea to that of a walnut, and of greenish black colour. It is collected during the hot season by scraping the leaves and tops. Dr. O'Shaughnessy states, that in Central India and Nepal men in

* Derived from a memoir by Alexander Christison, J.B.S.E., "On *Cannabis Indica*, Indian Hemp."

leathern dresses brush forcibly through the plants, and the resin which adheres to them is then scraped off. And Dr. McKinnon states, that in Nepal the resin is gathered on the backs of naked coolies. Dr. Royle says, "The glandular secretion is collected "from the plants on the hills by the natives pressing "the upper part of the young plants between the "palms of their hands and scraping off the secretion "which adheres."

V. In the preparation of the electuaries, &c., butter is used as the means of separating the active principle, consequently these compounds are very apt to become rancid.

They are thus described by M. Charnac in the "Annuaire de Thérap." for 1846:—1. Preparations mixed with honey or melted sugar. 2. A more active form called *haschich kava-mesk* (musked drug), containing musk, essence of roses and almonds, of pasty consistence, and of the colour of impure honey; the quantity used being about the size of a walnut. 3. Two kinds are found at Smyrna, called Israël, the one a fine powder, the other a roll of firm mastic consistence. 4. A black round kind has great aphrodisiac repute among the Fellahs, but in this case it is found that cantharides is added to increase the effect.

At Cairo the compound from which the various conserves are prepared is thus made. Equal parts of well-sifted haschich, butter and water are put in a vessel on the fire, after some boiling the water is dissipated; the residue is twisted in a cloth to isolate the fatty matter, and to this the different spices are added.

Haschich is to the Arabians what opium is to the Turks and Chinese. Hachach, signifying in Arabian drunkard, is the epithet applied to those who eat haschich.

The Arabians smoke the powdered plant, free of seeds, which contain fatty, disagreeable-tasted matter, along with tobacco.

VI. Landerer describes a tincture of hemp used at Cairo, called chatsraky, made by infusing in spirit for three weeks with a gentle heat, the varnish-covered bark sliced from the stems when the plants are in flower.

As the activity of the preparations of hemp depends on the presence of a resinous varnish on the leaves, and consequently as the most active of these is found to contain the largest quantity of resin, it becomes a matter of great importance to decide upon the proper period for collecting the plant.

M. Gastinell, an apothecary at Cairo in 1849, states that he found the active powers of hemp to depend on a resinous matter which forms on the leaves as the seeds ripen. Again, M. de Charnac observes, that in Egypt the tops of the plants are used at the end of flowering, but before complete maturity of the seeds. And Mr. Jameson, Director of the Botanic Gardens at Saharumpore, makes a like statement in a letter dated 17th August 1849. As this letter contains an interesting account of hemp in that part of India, it has appeared to me to be well worthy of a place in this essay. He says:—

"In Kimaon and Gurhwal *cannabis* is grown in large quantities, partly in order to obtain its resinous secretion, and partly for its bark, from which a strong coarse cloth called *bungila* is manufactured; it forms the dress of the poorer inhabitants, particularly through Gurhwal. It is sown in July and gathered in October. From the female plants only the churrus is procured. Towards the beginning or middle of October the seeds begin to form, and when in this unripe state the upper part of the plant is pressed between the palms of the hands, it deposits upon them a yellowish green secretion, which is scraped off with a blunt knife; this is the well-known churrus. From the male plant bhang and cath are prepared. Bhang is prepared by drying the leaves and other paris of the plants, both male and female, and is thus used:—A small quantity is put into a mortar with a little water and pounded, the refuse water being thrown away, an additional quantity of water is then added, from half a pint to a pint, depending on the strength required, and well mixed; it is then strained through a fine cloth, the residue thrown away, and the liquid is ready for drinking, a wine glassful or more being taken at a time. Gangah is the thin preparation, and is the produce of the upper portion of the stem, that is about 1½ foot; it is only used in the hookah to smoke; this also applies to the churrus. The gangah is carefully dried and mixed with an equal quantity of tobacco, and well rubbed together in the palm of the hand; it is then ready for the hookah. We have thus the three preparations:—1, churrus; 2, bhang, or subzi; 3, gangah, or ghangah. The first is only prepared on the hills, and the two latter are common to both hill and plain, but bhang is principally prepared in the latter. At Bhaeit, about 16 miles from Saharunpore, it is prepared in large quantity, and is subject to a heavy duty; yearly from 40,000 to 50,000 maunds are produced (a maund is equal to 80 lbs.). The reason why the churrus is not prepared in the plain is, because the plant does not secrete the resinoid principle, showing that its secretion is connected with climate. But still the plants are identical in external characters, and you will, I think, find that the European and Indian plants are also identical. In order to ascertain the fact, I send you a small packet of hemp seeds procured at one of the Gurhwal villages, where it is grown in vast quantity. In your letter you say that the active principle forms on the stems and leaves; this is not the case, as it is only procured when the seeds are in an unripe state; attempt to procure it before this period, and none will be forthcoming. It will appear strange how ignorant natives can distinguish female from male plants, were you to see the plant growing your surprise would soon be removed. The female plant when ready for making churrus has at its upper part a 'bunchy' appearance, whereas the male plants have become by this time mere stems and leaves, the flowers also having fallen off.

"In October, in crossing the Himalayas from Almorah to Missouri, I have passed through dozens of villages 6,000 to 8,000 feet above the level of the sea, and seen hundreds of men, women and children, all employed in making churrus. The plant grows to a height of from 10 to 14 feet."

D.—OPIUM.

Observations by R. Saunders, Collector of Ghazeepore, forwarded with the specimens to this Exhibition.

The cultivation of poppy in India can be traced back as far as the sixteenth century. An allusion is made to the opium and saltpetre monopolies of the Emperor Akber in the reign of Queen Elizabeth, in the celebrated Ayeen Akber of Abul Fuzul, prepared during the latter part of the sixteenth century.

The poppy plant has been cultivated in Nepaul for

years, doubtless for as long or longer than in Bengal and the North-western provinces; and it may be that the opium from India was first introduced into China by the Nepaulese, and afterwards by the Dutch, who used to purchase the drug for export, long before the East India Company held possessions in this country.

The process of the manufacture in India at the present day is as follows:—

About the end of January the poppy plant commences to flower, and continues till March; the petals are watched, and are carefully collected in the following manner,—

The forefinger and thumb encircle the stem just beneath the pod, and with the other fingers drawn inwards a kind of tube is formed; this tube is then gently raised straight over the pod, and if the petals are matured, they come off. They are never plucked off, as it would injure the pod. When a sufficient quantity has been collected in this manner, the cultivator proceeds to manufacture them into flat cakes, something like pancakes, or, as they are technically termed, flower-leaves, and the opium cakes are wrapped in these leaves.

The manufacture of the flower-leaf is simple and inexpensive. A circular-ridged earthen plate, about 12 inches in diameter, is placed over a slow fire, the required quantity of petals is then placed in it, and pressed with a damp cloth pad till they have adhered together; the flower-leaf is then removed and allowed to dry, when it is ready for use in the manufacture of opium.

In February the poppy plant is pretty well advanced, and the prospects of the season can then be fairly ascertained.

In some instances in January, but generally in February and March, the pods mature, and are lanced in the afternoon; the opium is allowed to exude and remain on the pod till the next morning, when it is scraped off gently with a small iron scraper, and the thumb or finger is then run over the incisions to close them. The number of incisions required to complete exudation of all the juice varies, and ranges from one to five and six, and occasionally to seven and eight in some isolated cases. The opium thus collected is placed in earthen or brass vessels slightly tilted, to drain off the dew and any opium juice it may contain; and when the whole of the drug is collected and thus treated, it is carefully manipulated, put into a new earthen pot, and set aside in some ventilated and safe place. Should the opium be of low spissitude, it is exposed in some shady place (not in the sun), turned over occasionally and very carefully, so as not to injure the grain, and is so treated till it reaches the required consistency, and remains in the custody of the cultivators until it is weighed.

After the opium has been extracted, the pods are allowed to dry, and are then broken off, and the seed collected. An ample quantity is kept by the cultivator for next season's sowings, and the remainder disposed of to traders.

The leaves of the plant are left on the podless stalks, and when withered are collected and delivered into the Government opium factory, and termed technically *trash*, for packing the opium balls in the chests, for which payment is made at the rate of annas 12 a maund.

The flower-leaves are weighed in March and April, and are sorted into classes. The first is of fine texture and colour, and from 8 to 10 inches in diameter; the second slightly inferior in both texture and colour, and the third is of a roughish and thicker quality; as sorted they are weighed, and the weight of each quality is entered in the leaf weighment book, when the value of each quality is calculated at the rate of Rs. 10, Rs. 7, and Rs. 5 a maund.

The flower-leaves are despatched by country boats or carts to the factory at Ghazeepore, and on arrival are weighed, examined, and classified.

Before the opium weighments commence, the several books are prepared; new earthen jars and pots, with covers, are purchased and carefully weighed, coarse cloth, sealing wax, and twine for closing and sealing the jars, and baskets for holding the filled jars, are also purchased; every scale, beam, weight, pan, and reservoir is carefully examined and tested, and then the weighments take place.

After the opium has been brought in by the cultivators, it is tested, and samples of each consignment are taken for a careful chemical analysis to the opium examiner's room to detect adulteration. The opium is then stored in large wooden vats.

The pure opium, which is fit for the China provision, and the consumption of the local market, is stored in large wooden vats, each holding about 50 maunds (about $1\frac{1}{2}$ tons weight); the opium derived both from the assameewar and chullan sources is not stored anyhow, but each parcel according to its class is emptied into a vat bearing the designation of that class; the light divisions are arranged in lines.

As much opium as can be removed from the vessels by light scraping is taken, that which adheres is afterwards removed by second scraping, and set aside for lewah, and that which persistently adheres is removed by water; this is called washings, and when evaporated is used in making lewah; the washings alone are valued at about Rs. 65,000 a season at Ghazeepore Factory, and the opium thus recovered amounts to over one ton in weight.

When a vat is filled, the opium in it is stirred by long wooden poles daily until the drug is used for caking.

When there are about 2,000 maunds (about 75 tons) stored—we have accommodation for upwards of 6,000 maunds—we can, if we possess the proper quantities of the various consistencies, commence caking. One may ask, but why have you not caked before you collected so much? The reply is, we are bound by order to cake at a consistence of 70°; that is, when the opium contains 70 per cent. of the pure dry drug and 30 per cent. water. We are allowed—as it is very difficult to hit off the consistence of 70° exactly when manipulating such a large quantity (nearly three tons) as we require daily for caking—to cake when the assay shows the opium to be above 69·50° and under 70·50°, so that we are allowed half a grain above and below the standard of 70°.

To prepare the opium for caking, a certain number of vats are marked of each class; a long iron instrument, something like a cheese-taster, is thrust from the top to the bottom of the vat (it forms half a hollow cylinder when open, and a complete cylinder when shut), and closed; the sample of opium is withdrawn, the contents of the sample drawn are thoroughly mixed up, and three specimens of 100 grains are assayed; the mean of the three results is taken as the correct consistence. By the same process the samples from all the vats, which have been marked, are taken and assayed; those which will give, when mixed together in certain proportions (by rule of alligation), opium at a consistence of 69·50 or 69·40° are exported to the alligation vats, and the contents of the selected vats are equally distributed over the

seven alligation vats, so that the consistence of each may be uniform; the opium is then well mixed by rakes and by men walking about in it, and kneading it with their feet. At about 3 P.M. it is removed from these vats into the five caking vats; equal quantities being taken from each of seven alligation vats are distributed over the five caking vats. On the following morning the opium in each vat is again mixed by six men allotted to each from 5 A.M. to 8 A.M. Four samples are drawn from each vat, and thoroughly incorporated together, and three specimens from this mass are taken for assay; this pertains to every caking vat. Should the whole of the assays of each caking vat come out above 69·50 and under 70·50, the agent of the Ghazeepore Factory gives the order to cake, or in his absence the principal assistant does so.

The cultivation of the poppy plant is rendered as far as possible both profitable and popular.

A large room, 944 feet long by 27 feet wide, accommodates the 250 cake-makers; each cake-maker has a number and a place assigned for him to work at, the cake-maker's number being printed on the wall above his seat. Each man is provided with a wooden seat, and is furnished with a brass cake mould, forming the half of a hollow sphere; he has also a tin vessel graduated so as to hold 4½ chittacks of lewah, the regulated quantity which is used in making the shell of each cake.

The opium produce per beegah ranges from one to fifteen seers, according to the quality of the soil, and the attention and care bestowed on the cultivation, and state of the weather. The profit varies and ranges from Re. 1 to Rs. 50 or upwards per beegah.

The following materials are used in making a cake, and as it is necessary that every cake should be of the same weight, viz., two seers, every precaution is taken to ensure the accurate determination by weight or measure (calculated for weight from actual experiments) of the articles which compose the cake. The proportion of each article is given in the table below:—

	Seers.	Chittacks.
Standard opium at 70	1	7·5
Lewah at 53	–	4·5
Flower leaves	–	5·0
Water	–	·5
Trash	–	·25
Total weight of cake on the day of manufacture	2	1·75

The lewah now demands attention. Lewah is a paste made by breaking down opium in water which has been used for removing the traces of opium which adhere to the jars and vessels in which opium has been placed; this is called washings or technically *dhoe;* the washings contain about 8 to 10 per cent. of opium; the opium is broken down in large vats containing about 800 cubic feet, and about 8 per cent. of pussewah is added to the lewah to render it smooth and glutinous.

When the lewah has a consistence of over 52·50 and under 53·50, it is called standard lewah; its consistence is determined every morning by assay, and until it is of the proper degree, caking cannot commence.

The lewah is delivered in bulk by weight, and the quantity to be used for each cake is measured by a brass cup which delivers 4½ chittacks at 53°.

The poppy flower-leaves agglutinated by the lewah form the shell of the cake; five chittacks of dry leaves are required for each cake; but as the leaves vary in weight according to the amount of moisture in the atmosphere, ten seers are steam-dried daily to ascertain how much moisture they contain; knowing this, an exact increase or decrease in the weight of leaves can be made, which is required to compensate for the moisture contained. This control is necessary, since if five chittacks of leaves are used, which contained much moisture, when the leaves parted with that moisture by evaporation in the dry months, the cakes would be light.

The loss in weight which the leaves sustain by steam-dryings is determined on the day previous to their being required for use; the bulk required for the caking of the next day is weighed out and damped in the afternoon, so as to render the leaves supple and pliant; when dry they are crisp and break readily.

Having explained the preliminaries of caking, the method will now be described. Down the centre of the room the scales for weighing opium and the lewah vats are placed; there is a weighman for each scale and two assistants; the weighman weighs the opium on a very delicate scale, and one assistant searches the opium to ascertain finally that there are no extraneous matters in it; the second man arranges the movable tin pan, and places the opium on it.

When caking commences the caking vat room doors are opened, and the opium is brought out in tinned sheet-iron vessels holding 20 lbs. each. One vessel is set before every scale, and a sufficient quantity for one cake having been searched is handed over to the weighman's second assistant, who adjusts the quantity in the pan. When the weighman declares it to be correct the tin plate with the opium is taken away by a boy to his cake-maker, who has been supplied in the meantime with a tin cup filled with the requisite amount* of *lewah* for a single cake; he has also received the proper quantity† of leaves for one cake. Having these by his side, he now rapidly forms in the brass mould the lower half of the shell of a cake, pasting by means of the lewah, leaf over leaf, until the thickness of about seven-sixteenths of an inch has been obtained. He allows in so doing the upper part of some of the leaves, which he tears in half and places vertically, to hang down outside the mould (with these he forms the upper half of the cake). The cake shell is principally made of half leaves vertically placed, other halves being inserted horizontally so as to give equal strength in all directions. Having finished the lower half of the shell he takes the tin plate and accurately, to a grain, removes the opium into the half of the shell now ready for its reception; it is pressed upwards into the shape of a cone, some pieces of leaves are applied horizontally to it, then some lewah, now some of the parts of the leaves hanging down are pulled up and secured, more pieces are applied horizontally, and at last, having pulled up and properly arranged all the pieces of the leaves which were hanging around the

* 5 chittacks. † 2 chittacks.

cup, a whole leaf is applied to the top, and the cake is now finished.

It is a sphere of about the same size as a 24 lbs. spherical shot; it is removed from the mould and dusted with a little coarsely powdered poppy trash, so as to prevent its adhesion to the cup, made of burnt unglazed pottery, which is of the same shape as the mould in which the cake was made. It is now carefully placed in the cup while still soft, and it is carried out by the cake-maker's boy, who puts it in the sunshine on a little square of brick flooring, which has been allotted to the cake-maker whom he serves, and where a small board stands bearing his master's number.

Before removal a paper ticket is pasted on the cake bearing the cake-maker's number, and the date on which it was made; every cake has its ticket, so that we can at any time trace its history, and by this means we can hold every cake-maker responsible for the careful manufacture of his cakes; by means of these tickets, should anything be found wrong with any cake, it can be brought home to the man who made it.

The caking begins generally at 10 A.M., and lasts till half-past one or two o'clock in the afternoon; usually 20,000 cakes are made daily.

The cakes are on the evening of the second day counted and sent to their destination in one of the cake godowns, where they and their cups are stored in racks.

The great object to be attained is to make the cake as carefully and compactly as possible by one operation to have the shell even in thickness throughout, and to spread the lewah uniformly between the leaves. This can be attained by good cake-makers under strict supervision; cake-makers usually make 60 cakes a day; every good cake-maker gets 20 or more additional ones to make, for which they receive an extra allowance.

The flower-leaf forms an excellent covering; it is in every way suitable, but it has its drawbacks. It is affected by wet, and is liable to be attacked by mildew, borers, and white ants, while it will not resist hard pressure applied to any small area of its circumference; however, it certainly most effectually retains the moisture and aroma of the drug enveloped in it, and by its own fragrance adds to that which the opium *per se* contains.

The cake godowns are large and high brickwork buildings, with galvanized iron roofing, well ventilated by numerous windows and doorways. The windows have iron gratings fixed in the masonry outside, and skeleton doors are provided for the best godowns to admit of the entrance being closed while free perflation of air is not interfered with. All the doors and windows of the better class godowns are further secured from thieves by galvanized wire netting, so that cakes cannot be cut up and passed out in large pieces.

Inside the godowns are wooden racks, extending nearly up to the roof; there are intervening rectangularly-placed passages traversing the frames to permit of ventilation. In these racks the cakes are stored in their cups.

Every third day the cakes, wherever placed, come down to the ground, are lightly hand-rubbed with a little trash, turned, replaced in their cups, and sent up again to be placed in the racks. The object of turning is to allow the shell of the cake to dry evenly.

The packing takes place only in dry weather, and after the morning dew has been dispersed.

Into a strong mango-wood chest, one yard long and two feet four inches wide, 40 cakes are packed in two layers of 20 each; the balls are prevented from rolling about by each one being placed in a compartment; and in these chests, varying in number according to the year, the opium cakes find their way to Calcutta, whence they are shipped to China at the close of the annual Government sales, each chest realising as much as 13*l.*, or in other words 1,300 rupees, in an average good season.

The following specimens are exhibited by the Opium Agent of Benares.

4,237–8. Ball or provision opium.
4,239–40. Abkaree opium.
4,241–2. Coarse poppy trash.
4,243–4. Fine poppy trash.
4,294. Canvas and nails used in packing opium.
4,254. Opium moulds for making balls.
4,246. Poppy flower petals.
4,248. Lewah or opium paste.

Exhibited by Berar Local Committee.

827. Opium.

Exhibited by the Indore Local Committee.

880. Opium.

Exhibited by the Commissioner of Benares.

7,913. Ball opium.
990. Opium, from Nagpur.

GROUP V.—TEXTILE INDUSTRY AND CLOTHING.

SECTION I.—WOOLLEN FABRICS.

A.—WASHED WOOL AND HAIR, CARDED WOOL AND WORSTED, COMBED WOOL AND YARNS.

Punjab Committee.

Samples of pashm (shawl wool), white and natural colour, with thread made from the same.

Turfani Pashm.—This pashm, the produce of the Thibetan goat, is the most valuable kind of shawl wool. It is imported from Yarkand, and is used in the manufacture of Cashmere shawls.

Changthani Pashm.—This shawl wool is used by the weavers of Amritsar and other places. It is ordinarily white in colour.

Specimens of woollen thread, white, or various colours, and of the natural colour.

Amritsar Local Committee.

Pashm from Yarkand and Ladakh.

"Wahab Shahi" Pashm.—This is a very soft white sheep's wool which is imported from Kirman, a province of Persia; it is used to adulterate genuine shawl wool at Amritsar and other places.

Kabuli Pashm.—A very soft goat's hair, not unlike the Thibet shawl wool, only not so fine; it is used (principally in Lahore) for making "Lahori chaddar," or soft wool wrapper.

Samples of thread from the Wahab-shahai, Kashmir. Yarkandi and Kabuli wools, Amritsar.

Central Jail, Bangalore.

Mysore wool, white, black, and various colours.

India Museum, London.

Samples of sheep's wool, goat and camels' hair, &c.

B.—CARPETS, BLANKETS, AND OTHER FABRICS.

Madras Committee.

Turban cloths (3), with lace and silk lines. Madras.
Turban cloths (2), with gold squares and flowers. Madura.
"Sarees" (5). Native female dress. Madras.

The "Saree," or garment-piece, worn by Mahratta women, is without seams, and is, in fact, a long shawl. It is first twisted around the waist, then thrown over the left shoulder, and returned again over the right shoulder; some of the folds hang down in front, while others are draped over the back. This "Saree," with a small sleeved bodice, completes a lady's attire; the higher the class of the lady, the lower her "Saree" will hang. Women of the labouring caste seldom wear the "Saree" below their knees. In the Nagpore country every modest Hindu woman drapes one fold of her "Saree" over her head, whereas, in the Konkan, respectable ladies have their heads uncovered. Gond women always keep the head uncovered; some of them wear chignons, and all wear jungle flowers in their hair on festivals.

"Sarees" (7), of various colours. Madura.
"Saree." Half silk, puce, with gold flowers. Madura.
"Saree." Red cloth, with gold flowers. Madura.
"Saree." Half silk, puce, with gold stripes. Trichinopoly.
"Packadi" or "Choli." Madras.

Bombay Committee.

"Kuthee." Woman's head dress. From Kutch.
"Dhablee." Blanket. From Kutch.
"Dhablee." Blanket, from Surat Jail.
Blankets (6), from Aden.
Hair-strings, from Aden.

N. W. Provinces Local Committee.

Blankets (9), from Mozuffernuggur and Jaloun.
Cloth (2 pieces), chintz and byed. From Jaloun.

Punjab Committee.

Two woollen dressing gowns, made in Kábúl, of beaten-out wool "Malidá," embroidered respectively in gold and silk. From the Peshawar district
Dressing-gowns (3), made of camel-hair and white wool. "Kashka."
Dressing-gowns (2), made in Kabul, white and dark brown. From the Peshawar district.
Brown felt, made in Persia, and piece of coloured work, "abrak." From the Peshawar district.
Table-cloth (very rare), worked on one side with shawl pattern, on the other with a design in velvet pile. From Kashmere.
Woollen carpets (2). From Multan.
Cloth (2 pieces), striped and checked. Cotton and wool mixture. Ludhyana district.

Devi Sahai and Chamba mal. Amritsar.

Pieces (4) of Amritsar malidá. Grey, light brown, and dark brown.
Pieces (2) of Cashmere malida. Grey and drab.

Lahore Jail.

Hearth-rug, new shawl pattern.

Mysore Local Committee.

Bangalore pile carpet rug.
Do. do. prayer pattern.

Central Jail, Bangalore.

Pile carpets (2). Persian flower pattern and prayer pattern.
Bangalore plain carpet.
These carpets were made in the Central Jail by convicts who have been entirely taught in the jail, none of them knowing anything of the art previous to their admission. The two first are of Persian patterns. The last is of a kind peculiar to Mysore; it is the same on both sides.

Indore Local Committee.

Blankets (2). "Numda." Made at Indore.
Carpet. Made in Indore jail.

India Museum, London.

Collection of woollen fabrics from Bombay, N. W. Provinces, the Punjab, Oudh, and Sind. (From the London Exhibition of 1871.)

Vincent Robinson & Co., London.

Carpets (7), from Calcutta, the Punjab, Malabar, Madras, and Kashmere. Of these the largest is one from Calcutta, measuring 23 ft. × 17 ft.
Rugs (6), from Sind, Malabar, and Madras.

Watson, Bontor, & Co., London.

Indian carpets (8). Of these the largest measures 22 ft. 7 in. × 16 ft.
Indian rugs (15). The largest measures 8 ft. 1 in. × 4 ft.

Gregory & Co., London.

Carpets (4), from the Deccan, Northern, Southern, and Central India. The dimensions of the largest of these carpets are 24 ft. × 13 ft. 1 in.
Indian rugs (4).

Lapworth, Brothers, London.

Carpets (2) from Tanjore and Ellore. The carpet from Tanjore measures 23 ft. 11 in. × 17 ft. 5 in.
Indian rugs (4).

Farmer and Rogers, London.

Bornouses (16).
Do. small (12).

C.—MIXED FABRICS, INCLUDING SHAWLS.

Madras Committee.

Rampore chudder shawl, with gold embroidered ends.

Punjab Committee.

Rampur chaddars from the Ludhyana district.
Rampur chaddars are plain shawls or wrappers of great softness and durability, made at Ludhyana, from the wool of Rampur, the chief town of Bishahr. The wool, which is imported into Ludhyana in large quantities, is of exquisite softness, almost approaching that of the Kirmani sheep.
Cashmere shawls, from Cashmere.

Devi Sahai and Chamba Mal, Amritsar.

Rampur chaddars of various colours.
Embroidered square shawls of various colours made of "Malida."
Malida is a fabric (made of shawl wool) which has been pulled or rubbed so as to have the surface felted like cloth.
Cashmere needle-worked shawls, white, grey, and blue.
Amritsar needle-worked shawls, black and red.
Vice-regal chaddar of finest pushm, Amritsar.
Shawl pieces, "Jamawar," striped.
Jamawar is a sort of shawl with a pattern in stripes, intended, as its name implies, for a gown piece (Jama).

Ahmad Shah and Ahsan Shah, Ludhyana.

Cashmere shawls.

Kadir Bakhsh, Sabathu.

Rampur chaddars, white and dove colour.

Hamza, Sabathu.

Rampur chaddar. red.

Farmer and Rogers, London.

Shawls from Cashmere and Dacca.
Circular shawls.
Small circular shawls.
Square net shawls.

COTTON COLLECTION, PREPARED UNDER THE DIRECTION OF GERALD FITZGERALD AND H. RIVETT-CARNAC, FORWARDED FROM INDIA TO THE LONDON INTERNATIONAL EXHIBITION OF 1872 AND SENT FROM THE INDIA MUSEUM TO THE VIENNA UNIVERSAL EXHIBITION AT THE SUGGESTION OF BARON MAX KUBECK, ON BEHALF OF THE AUSTRIAN GOVERNMENT.

REPORT BY H. RIVETT-CARNAC ON THE COLLECTION. (Reprinted from the Journal of the Society of Arts, of 8th November 1872.)

THE International Exhibition of 1872, the programme of which included raw cotton, and everything connected with cotton manufacture, appeared to offer an excellent opportunity for bringing together a complete collection of the cottons grown in India, and of the articles manufactured therefrom; and of illustrating at the same time the measures adopted during the last few years by the Indian government to improve the cultivation and preparation of the staple, and to assist the trade in this most important article of Indian produce.

Considerable interest was taken in the subject by the late Earl of Mayo, and careful instructions were issued by his government to the central and local committees appointed in India to forward the views of Her Majesty's Commissioners for the International Exhibition, and to render the collection as perfect as possible. The result is the large array of Indian raw cotton, together with specimens of everything connected with the cultivation of the plant, its preparation for market, and the various processes of the manufacture in India of thread and cloth, exhibited in the West Quadrant adjoining the Albert Hall, specially assigned by Her Majesty's Commissioners for the purpose.

It is proposed in the present paper to give a brief sketch of the cultivation of the cotton plant in India, and to notice the chief points of interest in this collection.

Owing to climate and other influences, the staple of Indian cotton is unfortunately short, and not so well adapted to spinning as American, Egyptian, and other superior varieties. Until the commencement of the American civil war, and the consequent scarcity of cotton, the demand for "Surats," as Indian cotton was generally called, was comparatively small, both in the United Kingdom and on the continent of Europe. The year 1862, however, saw the manufacturers glad to get almost any description of cotton for their mills, and then came a great demand for the despised Surats, at prices far beyond the native cultivator's wildest hopes. Although the quantity that up to that time had found its way to Europe was, comparatively speaking, inconsiderable, cotton had always been cultivated on a large scale in India, chiefly for local consumption, and for exportation to China and elsewhere. The crop is one well adapted to the soil of many of the more fertile provinces of India, and is well understood by and popular among the peasantry. The consequence of the greatly enhanced prices offered for the produce was a remarkable extension of the cultivation of cotton throughout India, accompanied by the withdrawal of some quantities from local consumption. It is not very easy to collect accurate statistics of the area under cotton cultivation throughout all the provinces and presidencies in India. In some cases the returns prepared are merely rough estimates, but, on the whole, they give a fair idea of the effect on the cultivation of the sudden rise in the price of cotton. Thus, for instance, in the Central Provinces of India the area under cotton cultivation in the year 1862 was 375,000 acres. In the year 1865 it rose to 690,000 acres; and, although of recent years the cultivation has followed the prices, and has somewhat fallen off, there are still about 600,000 acres sown with cotton in those provinces. In the adjoining district of the Berars, in which some of the best Indian cotton is grown, the proportion of increase was hardly less than that noticed above, and the same may be said of the extension of cultivation in the Bombay Presidency. The following table shows

APPROXIMATE STATEMENT OF COTTON CULTIVATION IN INDIA.

Political Divisions.		Cultivation in Acres.	Average Produce per Acre in lbs.	Total Produce in Bales of 400 lbs.
Country drained by Bombay.	Bombay Presidency and Sindh	2,200,000	80	440,000
	Bombay Feudatories	2,000,000	80	400,000
	Central Provinces and the Berars	750,000	80	150,000
		1,250,000	80	250,000
	Nizam's Territories, Central India, Rajpootana, &c.	2,000,000	50	250,000
	Punjab sends to Kurachee	800,000	50	100,000
	Total Bombay Drained Country	9,000,000	80	1,590,000
Madras	Madras	1,320,000	80	264,000
	Mysore	30,000	80	6,000
	Total Madras	1,350,000	—	270,000
Bengal	Lower Bengal	400,000	50	50,000
	N. W. P.	1,600,000	80	320,000
	Oudh	80,000	50	10,000
	Punjab (*see* above)	—	—	—
	Total Bengal	2,080,000	—	380,000
British Burmah (total)		60,000	50	7,500
Sundry Cultivation in the Interior in Native States (produce not exported)		400,000	50	50,000
	Grand total	12,890,000	75	2,297,500

approximately the area sown with cotton in the several provinces and presidencies of India, with the yield roughly calculated in bales of 400 lbs.

The Chief Sorts.

It will be seen from the foregoing table that the average quantity of cotton produced on an acre of land varies in different parts of India. This of course depends very much on the soil; and this brings us to the collection of the chief cotton-growing soils of India, which forms the first division of the annexe devoted to Indian cotton. The collection is very large, and includes a great variety of specimens sent by Messrs. FitzGerald and Terry, the honorary secretaries of the Bombay Committee, illustrating the chief soils of the Bombay Presidency, and by Mr. Dunlop, the honorary secretary of the Berars Committee, showing the class of land on which cotton is grown in these provinces. These specimens are preserved in air-tight, glass-stoppered bottles, and a large number of them will hereafter be analysed, with a view to ascertain the class of nourishment which ought to be returned to the land in the shape of manure, with a view to an increase in the produce. The sort most common throughout the cotton-growing tracts of Western India, and on which the best cotton is produced, is the "regur," or "black cotton soil," of the Deccan, which stretches from the western coast to the centre of India, near Nagpore, where it meets the lighter soil which covers the sandstone formation. The "regur" is thus described in Ansted's "Geology," page 343:—"Its colour is bluish black, greenish, "or dark grey. It forms into a paste with water, and gives a clayey odour. It absorbs "moisture rapidly, and parts with it in dry and hot weather. Its thickness varies from "three to about 20 feet. It is cultivated very easily, yielding a rotation of crops, consisting "of cotton and two kinds of corn. It rarely requires to be left fallow, and demands but "little husbandry, although for the last 2,000 years this soil has continued in cultivation "without manure, retaining the utmost fertility."

The following is an analysis of the "regur," taken from the same authority:—

Silica - - - -	48·20
Alumina - - - -	20·30
Carbonate of lime - - -	16·00
Carbonate of magnesia - -	10·20
Oxide of iron - - -	1·00
Water and organic matter - -	4·30
Total - - -	100·00

Several specimens of this soil are shown in the collection. In a sample-box, sent by Mr. Dunlop from the Berars, samples of the black cotton soil, and the sub-soils, from rich black mould to hard basalt rock, are exhibited.

Manures.

The second division of the collection shows the manures in use in India for fertilising the soil on which the cotton is grown. The Indian cultivator is shrewd enough, and thoroughly appreciates the value of manure. But in highly cultivated tracts, where cotton is grown, wood is scarce, and cow-dung, which would otherwise be returned to the soil as manure, is universally used for fuel. The quantity of manure available is thus small. Some attempts have been made of recent years to introduce artificial manures or fertilisers, which have been used with so much success in America. A specimen of one of these, distributed by the Cotton Supply Association of Manchester, is exhibited in the collection. It is composed as follows:—

10 parts soluble phosphate.
3 parts sulphate of ammonia.
3 parts nitrate of soda.
4 parts Peruvian guano.

The ingredients promise well for the recruiting of the exhausted soils. As yet the results of the experiments with these manures have not been very decided, consequent upon the unfavourable seasons during which they were tried. Much attention was paid to the subject by the late Earl of Mayo and by Sir Seymour FitzGerald, the late Governor of Bombay. In India, however, manure cannot be used, as a rule, without a liberal supply of water, and in the cotton districts the question of irrigation is yet in its infancy.

Implements used for Preparing the Soil.

A complete set of the instruments used in preparing the soil is next shown. The manner in which these implements are worked is illustrated by a series of sketches, prepared by J. Lockwood Kipling, Esq., of the School of Art, Bombay, and by photographs exhibited by the several local committees. The simplicity, and what may be considered the clumsiness, of the native appliances will perhaps be noticed. The implements have certainly undergone but little change for centuries. But, although to our eyes clumsy, they are wonderfully well adapted to the requirements of the people; they seldom get out of order, and what few repairs are required can be effected without difficulty by the carpenter and blacksmith, who form part of the institutions of every Indian village.

I cannot do better than quote Mr. Kipling's description of the *nágur*, or heavy plough, which accompanies the excellent sketch he has made of the process of breaking up the ground with this formidable looking implement. He says:—"The *nágur* is a heavy "plough, used in breaking up stiff land, and where, as in fallows, *kundar*, or conch grass, "has taken firm root. The projecting iron bar shown in the sketch takes the place "of the coulter of an English plough, while the elegant curves of the English plough-"share are represented by the rude hollowness of the under surfaces of the block which "support it. Yet the *nágur* is a very effective instrument; it is cheaply made and "easily repaired. Six bullocks are required for the draught, and each pair is attended "by a driver." The *buckhur*, of which a specimen is shown, is more generally used

throughout the cotton-growing tracts for preparing the land. It is thus described by Mr. Kipling, in the note which accompanies his very lifelike and accurate sketch:—"The "*buckhur* is the plough in common use when the land is fit and easily workable. It is, "perhaps, the most useful implement employed in the cotton field and in general cultiva- "tion. Practically it is a wide Dutch hoe, with a blade of about 1 foot 10 inches wide, "set in two feruled pegs depending from a heavy block of wood, from which a pole "ascends to the yoke, and fitted to a short handle sloping backwards. The parts are "separately carried to a field, and there joined up, while the simple rope-gearing is so "contrived that the stress of the draught pulls all tightly together. An important feature "in the simple machine is the bamboo carried by the driver, used to stimulate the animals, "but mainly to steady the plough. Two indentations are cut in the upper face of the "main block of the *buckhur*, and in one of them the point of the bamboo is rested. It "will thus be seen that the cultivator in this sketch is not gracefully posing himself, "since his weight, though comparatively slight, as he leans on his bamboo, is of vital "importance as a steadying power."

The process of sowing the cotton is simple. The seed prepared beforehand so as to make it run with ease, is dropped down hollow bamboo tubes carried by labourers, who follow the *buckhur* described above. The cotton is thus sown in rows of about three feet apart, soon after the first fall of rain, about the commencement of the month of June. It ripens in the month of November, when the picking commences, and about the end of the year the up-country markets are active. As yet it can hardly be said that much improvement has taken place in the agricultural implements in India. Light English and American ploughs, specimens of which are exhibited, have been found to answer well; but they are somewhat expensive, and the native cultivators hardly understand them yet.

The Cotton Plant.

The next step in the cotton collection is the ripe plant. Several specimens of these are to be found in the Indian annexe, and an extensive variety are to be seen in the hothouses attached to the exhibition, belonging to Major Trevor Clarke, who has conducted many important experiments with Indian cotton, especially with hybrids. The commonest variety in India is the *Gossypium indicum* or *herbaceum*. The *Gossypium Barbadense* and the *Gossypium Peruvianum* or *acuminatum* are to be found in temples, gardens, &c., in India, but they do not form any part of the cotton of commerce.

A complete collection of the weeds which give so much trouble in cotton cultivation has been sent to England, and will be of interest to botanists.

Measures Adopted to Improve the Cultivation of Cotton in India.

Of recent years, the government of India paid much attention to the improvement of cotton cultivation. Attempts have been made to introduce foreign varieties, but the result has not been satisfactory, save in the Dharwar country in the south of the Bombay Presidency, where the new Orleans cotton seed has been successfully acclimatised. In the Dharwar country, however, the climate is exceptionally favourable, and the foreign plant is cultivated there under conditions which cannot be secured for it in other parts of India. Endeavours have, therefore, been made to improve the indigenous plant, which, though inferior to its American rival, produces a very fairly satisfactory cotton. With this view, model farms have been established, under the charge of trained European superintendents, in the chief cotton-growing tracts of the Bombay presidency and in the Berars, central provinces, north-west provinces, and in Madras. The experiments, so far as they have gone, seem to indicate that the staple of the Broach, Hingunghat, and of the superior Indian cottons, are about as good as can be grown under all the conditions of climate and soil with which the plant has to contend in India. But although there appears to be small prospect of improving the length of the staple, it is hoped that the yield may be increased by improved cultivation, and to this subject, which in the present state of the cotton trade is of great importance, much attention is being paid at the model farms established by the government. The question all turns upon the cost of the improvements. Greater care in cultivation means, in most cases, an increase of expense.

If the return obtained by the improved cultivation more than counterbalances the extra expense incurred, the natives will, in course of time, adopt the suggested improvements. And it is with a view to prove practically the merits of these improvements that the model farms have been established in the centres of the cotton-growing tracts. Many specimens of the produce grown on these farms are exhibited.

Preparation of the Cotton for Market.

The branch of the cotton trade which has undergone the greatest improvement during the last few years is the preparation of the staple for market. It is not only to the cultivation of the crop that more attention is required before a really satisfactory article can be supplied to the European market. The picking of the article is conducted carelessly enough, and the effect is shown in the quantities of dirt and leaf found in Indian cotton. The high prices given by the European merchant of late years have very fortunately made the cultivator somewhat more careful in the manner in which cotton is cleaned and sent to market. By "cleaning" is meant the separation of the seed from the cotton wool. The cotton, when picked from the plant, is in the shape of "*kupas*," or cotton in the seed, the fibre adhering to the seed in the manner shown in the many samples sent to the Exhibition.

Cleaning the Cotton.

Several of the native instruments by which this process is performed are shown. The most primitive of these is the foot-roller, used in the southern Mahratta country of the Bombay Presidency. This consists of a metal roller, which, with the aid of a wooden slipper, is worked by the foot backwards and forwards amidst the cotton and the seed. By degrees the seeds become loosened and separated from the fibre, which is drawn under the roller, and remains on one side of it, whilst the seed remains on the other.

An improvement on this machine is the churka, or ordinary native gin, used with slight modifications in most parts of India. It consists of two rollers, either one of iron and one of wood, or both of wood, revolving in opposite directions. The fibre is drawn through between the rollers, the seed, which is too bulky to pass through, falling on the other side. The machine is very simple, and seldom gets out of order, and the principle on which it works is the foundation of most of the cotton gins made from time to time in Europe. Many valuable improvements have been made of late years, and several of the excellent machines now in use were to be seen at work in the cotton department of the Exhibition. The subject, too, is of so much importance that a series of trials with the gins of every class was held early in the present year at Manchester, and the report of Dr. Forbes Watson, of the India Office, on this subject will be awaited with interest. Since the date of the last Exhibition many new gins have been introduced into India. Dr. Forbes, the Cotton Commissioner, Bombay, paid much attention to the subject, and made some valuable improvements in the gins used in the Dharwar country. Large ginning factories, worked by steam, have been set up in the Broach, in the Berars, and in other parts of India, and a considerable proportion of the Indian cotton crop is now cleaned by the Platt-Macarthney gin, which is found to suit the Indian staple better than any other. Specimens of the ginned Broach cotton were exhibited, and considered to be of excellent quality. If the greater part of the Indian cotton crop could be brought up to this standard, there would be less cause to complain of Indian cotton. The machinery separates the seed from the fibre very thoroughly, without cutting or tearing it, and the absence of seed and leaf in this cotton makes it very popular. The Dharwar cotton grown from American seed is cleaned with the saw-gin process, which is sometimes found rather trying to the fibre. The native gins do their work fairly enough, but much seed is sometimes found with the cotton thus cleaned, some portion of it being doubtless often thrown in on purpose to increase the weight. Of the improvements made in India of late years in cotton gins, may be noticed, in addition to those of Dr. Forbes, already mentioned, the gin invented by Mr. Jones of Dharwar, and by Mr. Henderson, of the Mofussil Ginning and Dressing Company, at Oomraotee, in Berar, both of which are considered very successful.

The Cotton Ready for Market.

The cotton, having passed through the cleaning process, is now ready for sale, and it is packed by the cultivator, and carried by him to market. It was in this process that, in old days, Indian cotton suffered considerably in character. Little care was taken in packing it, and consequently the damage done by the weather, and by the dust and dirt that accumulated in transit, was generally considerable. The collection contains specimens of the nets and bags in which the staple is packed, and models of the carts and sketches of the bullocks and camels by which the bags of cotton are carried to market. In former times, in consequence of the state of the roads, the traffic was chiefly carried on by bullocks, on each of which a *bhojah*, or "load" of two bags, was slung, pannier-fashion, and carried thus for great distances. Although this means of transit is now but little used, the word *bhojah* still remains in the name of the conventional weight by which cotton is sold. Of late years the state of the roads, and the state of the trade also, have been greatly improved. European agents are to be found established at all the chief cotton markets in the interior of India, and as they pay a high price for cotton that has been well cleaned and carefully packed, much more attention is bestowed by the cultivators on these important processes. In fact, the great improvement that can be claimed to have taken place in Indian cotton since the date of the Exhibition of 1862, is superior purity, consequent on the manner in which it is now prepared for market and sent to England. It was at one time hoped that the staple might be much improved, and a greater length and fineness obtained; but, as already mentioned, it would appear that the climate of India militates against success in this direction. Still, the improvement in the condition in which Indian cotton is now brought to Europe is generally admitted, and is of no small importance. The circumstances to which this improvement is due are now to be noticed.

The Cotton Markets in the Interior of India.

In Mr. Kipling's very clever sketches, and in the series of photographs contributed by Mr. Fitz-Gerald and Mr. Dunlop, the hon. secretaries respectively of the Bombay and Berar Committees for the Exhibition, a very accurate idea is given of the manner in which the trade is carried on in the interior of India, and at Bombay and Calcutta, where most of the cotton is sent for export. Space will not permit of the subject being dwelt upon at any length in this paper. But it is to be noted that the extension of railway communication has, of late years, quite revolutionised the trade. In old days, when the chief cotton markets in the interior were separated from the sea-board by three weeks' journey over almost impassable roads, it was hardly to be expected that many European merchants would penetrate into the districts, and carry on business at out-of-the-way markets. The trade was then entirely in the hands of native dealers, and the cotton, before it reached Bombay, besides having to undergo a long journey abross difficult country and along indifferent roads, had to pass through the hands of many middlemen, whose interest in preserving it from dirt and damage was often small. The European merchant at the seaport was obliged to take what he could get. And this, as a rule, was cotton not inferior in staple to that which is produced in the present day, but which, from careless picking, bad packing, and too often from admixture with inferior cottons grown in other parts of India, was not fit for any but the most ordinary class of work. The railways have now connected Bombay with Allahabad, Madras, Nagpore, Calcutta, and Lahore, and nearly all the cotton markets in India have been brought into easy communication with the most important ports of shipment. Heavy machinery (to transport which over the roads of the interior was formerly a physical impossibility) can now with ease be carried to any of the up-country markets. The introduction of machinery has of late years largely increased, and in addition to the steam machines for cleaning the cotton already noticed, there is hardly an important market in the interior which is not now supplied with powerful steam-pressers for packing the cotton for export. The number of European merchants settled in the interior has increased in like proportion, and the consequence is that the cotton grown in a district, instead of passing through the hands of a series of middlemen, and being sent carelessly packed to the seaboard, is now bought direct from the cultivator by the European agent, and then packed on the spot, in full-pressed bales, and sent by railway direct to Bombay for shipment.

The extent to which the cotton trade in the interior has, of late years, passed into the hands of the European agents now established at most of the up-country markets, is indicated by the following figures of the exports of cotton in full-pressed bales from the Berars during the last few years.

COTTON EXPORTED FROM THE BERARS.

Season.	Proportion of the crop exported in full-pressed bales. Per cent.
1867–68	12
1868–69	29
1869–70	66
1870–71	74
1871–72	81

Although the figures given above refer to the Berars only, they give a fair notion of what has been going on in other parts of India also. The system has long since been extended into the chief provinces of the Bombay Presidency, and steam factories, managed by Europeans, are now to be found on the line of railway which connects Bombay and Madras. The screws, or full-presses, worked by hand are numerous in the North-Western Provinces, every considerable market of which has now one or two European agents established there for the purchase of country produce.

Specimens of cotton packed in full-pressed bales at the steam factories in the interior of India are shown in the Exhibition, and form one of the most important features of the improvement that has taken place since the date of the last Exhibition.

With the full-pressed bale the section of the cotton exports of India are closed. The adjoining table shows approximately the proportion in which each province of India produces cotton, the quantity exported, and the amount retained for home consumption. The parts which drain off their cotton supply are also shown.

APPROXIMATE STATEMENT OF THE EXPORT OF COTTON IN INDIA.

Political Divisions.	Name of Cotton.	Approximate Quantity of each sort exported.	Season of coming into the Market.	Approximate Quantity retained for Home Consumption.	Exports in Detail, in Bales of 400 lbs.				
					Port.	To Great Britain.	To the Continent direct.	To China.	Total.
Country drained by Bombay.									
Bombay Presidency and Sindh	Dharwar, Koompta	200,000	March	360,000	Bombay	991,000	135,000	53,000	1,179,000
	Broach, Surat	150,000	January						
	Kandesh	75,000	January						
	Sindh	20,000	January						
Bombay Feudatories	Dhollera	375,000	January						
Central Provinces and the Berars	Hingunghat	50,000	Dec. and January		Karwar	25,000	—	—	25,000
	Oomraotee, Akote	225,000							
Nizam's Territories, Central India, Rajpootana, &c.	Barsee, Bengal, Oomraotee	125,000	January and March						
Punjaub sends to Kurrachee	Bengal, Sindh	5,000	January		Kurrachee	26,000	—	—	26,000
Total Bombay Drained Country	—	1,230,000	—	360,000	Total Bombay	1,042,000	135,000	53,000	1,230,000
Madras — Madras	Western, Northern	240,000	March	30,000	Coconada	32,000	30,000	—	32,000
	—	—	—	—	Madras	94,000			124,000
Mysore	—	—	—	—	Tutocorin	84,000			84,000
Total Madras	—	—	—	30,000	Total Madras	210,000	30,000	—	240,000
Bengal — Lower Bengal, N. W. P., Oudh, Punjab (*see* above)	Bengal	200,000	Feb.	180,000	Calcutta	116,000	2,000	82,000	200,000
Total Bengal	—	—	—	—	Total Bengal	116,000	2,000	82,000	200,000
British Burmah	—	—	—	1,500	Rangoon	3,000	3,000	—	6,000
Total Burmah	—	—	—	—	Total Rangoon	3,000	3,000	—	6,000
Sundry Cultivation in the interior in Native States, produce not exported				50,000	Not exported,		—	—	—
Grand total				621,500		1,371,000	170,000	135,000	1,676,000

Cotton Retained in India for Home Consumption.

That portion of the cotton plant retained in the country, and not available for export, has now to be noticed:—

The Cotton Stalk.—In the first place some use is made of the cotton stalk and of that portion of the cotton seed that is not required for sowing. The stalk of the plant is used as fuel. Then, again, baskets and hurdles are made of it, and some portion of it is employed in thatching. Some attempts have been made lately to prepare a rough fibre from the stalk, but the result has not been successful. Specimens of articles made from the stalk are to be seen in the collection.

The Cotton Seed.—The cotton seed not required for sowing is chiefly used in the cotton districts for feeding cattle, with whom it is very popular. The seed contains much oil, and is nourishing. Of late years endeavours have been made to crush the seed and extract the oil, and with this view steam machinery has been set up in one of the large cotton markets of the Berars. Specimens of the oil are exhibited, and are highly spoken of. The refuse, consisting chiefly of the shell of the seed, can be made into a cake for feeding cattle, and may also be utilised in the manufacture of paper.

Raw Cotton retained for Local Consumption.

The quantity of raw cotton retained in India for home consumption is very large, and a rough estimate of this is given in the preceding table. The figures do not pretend to accuracy; there can be no doubt, however, that the quantity locally used is very large, and this fact is perhaps not always thoroughly realised in England. With this view, a complete collection of the various uses to which raw cotton is put in India has been brought together. Thus, the lamp-wicks burnt, with the *chiragh*, or earthenware lamp, in every native household are shown. Then there is a large assortment of tapes, and ropes used for harnessing bullocks and horses, and for tents, and of fishing nets of all sorts and sizes made from cotton. Pillows, mattresses, quilts are all stuffed with cotton, and specimens are exhibited. In Upper India, where the cold in the winter is great, nearly every native wears a coat padded with cotton; and tents, and *sutringar*, or rugs, are largely manufactured from cotton. It will therefore be readily understood that the quanity of cotton used in the above processes is not inconsiderable.

Manufacture of Cotton Yarn and Cloth.

This most important branch of the manufacture yet remains to be noticed. The subject is well illustrated by Mr. Kipling's excellent sketches, and by specimens of the rough but effective machinery in use throughout India.

The cotton when it leaves the gin, or *churka*, is not quite fit for spinning; it is too "lumpy." It therefore has to undergo the process of being "bowed." This is performed by the *punjara*, who, with the assistance of a "bow," "fluffs up" the cotton. It is then raked into *pootlees*, without which the spinner cannot perform his delicate operations. The simplicity of the spinning-wheel used throughout India is remarkable. At first sight it appears to be a clumsy little machine, but with practice yarn of an extraordinary fineness can be spun from it.

The specimens of yarn exhibited are numerous. The finest yarn is that manufactured in Dacca and in Central India. In the Nagpore province, the fine yarn is spun by the Dheres or outcasts, during the damp weather, as in the hot weather the thread is liable to snap. The finest specimen exhibited is one which, according to English classification, would be put down as about No. 240 yarn; and it is calculated that a pound of this fine yarn, if drawn out into a single thread, would reach a distance of 117 miles.

The yarn manufactured by the cotton-spinning mills, worked by steam in Bombay, Broach, Calcutta, Cawnpore, and other parts of India, is represented in the Exhibition. This branch of industry is making considerable progress in India, the mills in Bombay being particularly successful.

Cotton Cloth.

The last specimens shown are the various plain and coloured cloths manufactured in India. The increased importation of comparatively cheap Manchester goods has, of late years, much affected the weavers. The middle-classes wear English cloth in large quantities. There, are, however, two classes of cloth manufactured in India, which are not likely to be easily supplanted by foreign goods. The one is the common, coarse, strong cloth used by the peasantry. The people say that it is stouter than English cloth, and stands wear and tear better. The other is the luxurious fine cloth, used by the richer classes only, which the Manchester mills do not appear to have imitated as yet with much success. Many beautiful specimens of their rich fancy goods are exhibited. The yarn is very fine, the cloth woven with great care and precision. Some specimens have rich silk borders, others are embroidered with gold thread. They are very expensive, and are used only by the rich. The cloths with the rich borders are manufactured chiefly in the Nagpore country. The trade was fostered by the former Rajah of Nagpore, who brought together weavers from different parts of India, and who patronized them largely. The trade has somewhat fallen off since the breaking up of the rich native court at Nagpore, but most of the leading Hindoo noblemen and gentlemen of India still draw their supplies from Nagpore. Before the mutinies, the notorious Nana of Bhitoor used annually to send large orders to the Nagpore weavers.

Some of the cloth manufactories of the Nizam's territory are celebrated, and good specimens are exhibited. Dacca, too, still produces muslins of the most exquisite fineness, and a specimen of the "woven air" from a Dacca loom is to be seen contrasted with the strong thick cloth manufactured in Central India, and in common use among the peasantry there.

Indian Dyes.

The last section in the exhibition of Indian cottons and cotton manufactures is a collection of the dyes and of the blocks used in printing Indian cloths. The collection of dyes used in the Bombay presidency has been brought together by Dr. Bhau Dajee, of Bombay, and is of much interest. They represent accurately enough the dyes used throughout the provinces. In India, as elsewhere, successful dyeing depends much on the water. Some of the villages situated on the sandstone formation beyond Nagpore are celebrated for the excellence of the water obtained there, and the best specimens of dyed goods come from that neighbourhood.

Blocks used in Printing Cotton Goods.

The collection of blocks is very perfect and interesting. Mr. Fitz-Gerald has brought together specimens of every block used in the Bombay Presidency, and Mr. Dunlop has done the same for Central India; and thus nearly every popular pattern used in India is shown; some of the patterns are very quaint, others are particularly graceful, and they all deserve the attention of manufacturers who desire to please the popular taste in India.

Mr. Griffiths' Sketches of Indian Costumes.

The last point to be noticed is the series of water-colour sketches exhibited by Mr. Griffiths, of the School of Art, Bombay, showing the manner in which the cotton cloths exhibited are worn in India. These pictures have been very much admired for their artistic excellence. They are equally valuable as accurate representations of Indian costumes.

This concludes this collection, brought together with a view of showing specimens of everything connected with the trade and the cultivation of cotton in India. Each stage is illustrated by Mr. Kipling's excellent sketches, and by lithographs of the several processes through which cotton passes, from the seed to the loom; and those who take an interest in the cotton trade of India will find in the collection as practical a representation

as it is at present possible to give of the state of the trade in that country. The limit of this paper will not admit of the prospects of this trade being noticed at any length. But it may be mentioned that, although the Indian cotton may feel the recovery of the American trade, the very large increase of the American supply has not as yet affected India as much as might have been anticipated. Of late years Indian cotton has become popular among the Continental spinners.

The opening of the Suez Canal has much facilitated communication between India and the Mediterranean ports. The trade in this direction has largely increased, and there seems to be reason to hope that if a standard of cotton as high as that grown in most parts of the Bombay Presidency and Central India can be maintained, the demand for Indian cotton, on both the Continent of Europe and in the United Kingdom, will not fall off to any considerable extent.

COLLECTION OF SOILS FROM WESTERN INDIA.

Government of Bombay.

1–11. Samples of red, black, and white soils from various parts of Dharwar and Savanoor State.

12–18. Various soils, as red, black, white, yellow, &c., from Khandeish, including:—

No. 13. Black soil. "Kharee;" purely calcareous, mixed with quartz and devoid of humus; unsuitable for cotton.

No. 14. Black soil. "Bharkalee;" rich argillaceous loam. The best soil for cotton; only moderate rain required.

19–24. Samples of black, red, and other soils from Indapoor, Poona, including:—

No. 20. Black soil. "Amulkalee;" clayey loam; best soil for cotton.

25–42. Samples of soils from Broach, Surat, Pahlunpoor, Sind, and various parts of Kattyawar.

Kurrachee Local Committee.

43. Samples of cotton soils (3) from Sind.

Major A. T. Moore, V.C., Acting Cotton Commissioner, Bombay.

44–51. Collection of soils (manured and unmanured), from the Government Farm, Broach.

52–61. Collection of soils from Khandeish, including;—

No. 52. "Bhur-kalee." Black soil.

Rich argillaceous loam; the best soil for cotton. This soil is highly retentive of moisture, and only requires moderate rain; *i.e.*, about 25 inches distributed at regular intervals during the monsoon.

62, 63. Soils from the Government Farm, Dhurrangaum, Khandeish.

64–71. Collection of soils from the Government Farm, Sind.

Berar Local Committee.

72–88. Collection (17 samples) of cotton soils from Berar.

Government of Bombay.

89–103. Specimens (15) of ordinary farmyard manure of cattle, goats, and sheep, generally used in India. From Dharwar, Savanoor State, Khandeish, and Kattyawar.

Manure is usually applied every year in irrigated garden land "bagayet;" to unirrigated land every third or fourth year, but often at much longer intervals. The amount required for an acre of land is about two tons. The effect of goat manure is more appreciable the second year, as it requires some time to decompose, and become thoroughly mixed with the soil.

Major A. T. Moore, V.C., Acting Cotton Commissioner, Bombay.

104–107. Samples of various manures from the Government Farm, Sind.

H. H. the Rao of Kutch, G.C.S.I.

108–113. Collection (6 specimens) of manures used in the fertilization of land in Kutch.

AGRICULTURAL IMPLEMENTS.

Collections of Agricultural Implements from the Committees of Berar and Nagpore, the Government of Bombay, and H.H. the Rao of Kutch, G.C.S.I.

114–118. Ploughs ("Nagar" or "Hul") and models of ploughs from Berar, Nagpore, Kattyawar, and Kutch.

119, 121, 123–125. Sowing implements and models, as the native drill, "tippan," "koorgee," "doosa," or "duntul," from Berar, Nagpore, Dharwar, Khandeish, and Kutch.

122. Model of "Panbhar" (scale of one-third) from Khandeish.

The sowing drill of Khandeish, Nassick, and Deccan, though in the latter district four drills or "nullees" are sometimes used. For sowing monsoon grain crops in Khandeish, in the Deccan for grain indiscriminately, and sometimes for cotton.

126–135. Various weeding implements, as the "bukkur," "doondeah," "downie," and "vekhedoo," and the bullock-hoe or "koolpee," from Berar, Nagpore, Khandeish, and Kutch.

(No. 131.) "Chell Kontee." Harrow from Dharwar.

For clearing lands of weeds, standing crops, roots, &c., preparatory to sowing a fresh crop. Land is often prepared with this crop alone without subsequent ploughing.

(No. 133.) " Doom Koontee." Dharwar.
Used for the same purpose when the plants are larger. The success of the crop depends very much on this operation, which is usually performed three or four times.
(No. 132.) " Kullio Koontee." Harrow from Kattyawar.

380. Model of a cart from Berar.
137. A yoke from Nagpore.
541. Model of Persian water-wheel, worked by either camel or bullock, from Bombay.

COLLECTION of SAMPLES of COTTON SEED, SEED COTTON, and CLEARED COTTON, used and produced in the Presidency of Bombay, and other parts of Western India.

Government of Bombay, Sind, Malwa, Punjab, &c., Class of Cotton.

138, 218–232. Collection of cottons, cleaned and uncleaned, from Sind.
No. 138. Cotton-seed; prepared for sowing. Amulnair, Khandeish.
To prepare the seed for sowing, it is, as obtained from the " churka," well rubbed on close netting stretched on a rectangular frame or cot, which removes adherent fibre. It is then rubbed on the ground in a mixture of wetted cowdung and mud, or sometimes in the latter only. In this way it becomes perfectly smooth, and fit to pass readily down the sowing tube or " nullee," which would otherwise become choked.
No. 219. Seed-cotton, 1871–72. Amulnair, Khandeish.
Malwa kind; short coarse staple, like Sind, &c.; formerly grown in Khandeish, until replaced 1865–66 by Hingunghat cotton. This kind yields about 35 per cent. of fibre and 65 per cent. seed. The Khandeish Hingunghat yields about 30 per cent. fibre.
No. 225. Malwa cotton. Hydrabad, Sind.
Same variety as Hoseinabadee, Seonee, Sind, &c. Formerly grown in Khandeish, where it is still found in small quantities. Reported to be more productive than Khandeish Hingunghat; yields of 150 lbs. cotton per acre not unusual.

Coompta and Talikote Class of Cotton.

233–242. Collection of seed-cotton and cotton-seed from the Dharwar, Sattara, Poona, and Sholapoor districts.

Gujarat Cotton.

In Gujarat the " laria " or " lallioo " cotton, which is picked from the pods in the field, and the " wagureea " (" wagriah " of Dr. Forbes Royle), or cotton extracted at home from pods " kala " or " dhakanoo " collected in the field, are the two principal varieties of cotton grown.
2. The " laria " has a sub-variety, the " jureea," and the two yield the class of cotton known as " laria," its characteristics being a more soft and silky staple, and greater freedom from dirt, than the " wagureea " kind possesses. The " jureea " differs from " laria " in having a shorter and stronger staple, and a smaller proportion of fibre to seed.
" Laria " cotton is grown in the Duskrokee purgunna of Ahmedabad, and about Etola, in the Baroda State; also in Kattyawar; but in all these districts it occupies a very small area as compared to the " wagureea " kind. It is universally grown in the Broach and Surat districts, from which it is presumable that it was introduced in the northern and western parts of Gujarat.
The " jureea " cotton is grown within three or four miles of Ahmedabad, and around Memoodabad, in the Kaira district.
3. The " wagureea " or close-podded kind is the principal cotton of Northern and Western Gujarat, including Kattyawar and Kutch. It is inferior to " laria " in staple, which is more woolly and coarse, and comes to the market in a dirtier condition. It has several sub-varieties, of which may be mentioned the " nalkuntha," grown about Dholka and Sunund, with a weak staple and small yield; the " jatwadee," grown about Veerumgaum, superior to the above in point of staple; and the " Jhallawar," produced about Wudwan, &c., the best kind, and known as " fair dhollera." The term " nowlode dhollera " (from *nowa* new, and *lodné* to gin) is applied to the cotton fresh ginned from superior " kuppas " or " kala," and sent down just after the monsoon.
The cotton of Laria when ripe hangs pendent from the pods, which shrivel and dry up, and the seed-cotton is gathered in the field. The plant attains a height of three or four feet, thriving best in the black soil, which contains a considerable admixture of sand. In the " wagureea " kind the plant attains a height of two or two and a half feet. The capsules or pods only open slightly, and some force is required to extract the seed-cotton from the cells. The wool, therefore, remains confined within the pods which are gathered, in which state they are termed " kala " or " kalliah " in Gujarat," dhakanioo " in Kattyawar. The " kala " is stored in the house or in the *wakhárs* or ginning-yards, and the seed-cotton is extracted and ginned as required.

Verawul Class of Cotton.

243, 244. Specimens of Verawul cotton and cotton-seed, from Joonaghur, South Kattyawar.

Kutch Class of Cotton.

245–249. Specimens of cotton, seed-cotton, and cotton-seed, from Nowanuggur, Kattyawar.

Dhollera Class of Cotton.

250–269. Collection of cotton, seed-cotton, and cotton-seed, from various parts of Guzerat.

Dharwar American Class of Cotton.

270–272. Seed-cotton and saw-ginned Dharwar from Sind and the Dharwar district.

Oomrawuttee Class of Cotton.

273–285. Cotton-seed, seed-cotton, and cotton from Berar and Ahmednuggur.
No. 279. Barsee Oomrawuttee cotton. H. H. the Nizam's Territory.
Produced about Latoor, Pathree, and Namdair, &c., in H. H. the Nizam's Territory, and exported from Barsee station, in the Sholapoor

district. It is a "bunnee" cotton, and holds a good position among Oomrawuttee cottons; 1871-72. Rs. 260 per candy in Bombay on 16th March, 1872.

Hingunghat Class of Cotton.

140, 286–293. Samples of cotton-seed, seed-cotton, and cotton from Khandeish, Hingunghat, and Sind.

No. 286. Cotton seed; Hingunghat. Khandeish.
The kind universally grown in Khandeish at present; displaced the Malwa and Berar "bunree" mixture in 1867, after Akote had been tried in the district for one season. See previous remarks.

No. 140. Cotton-seed; Hingunghat. Khandeish.
The kind universally grown in Khandeish at present; prepared for sowing.

No. 287. Cotton-seed. Hingunghat.
From the Hingunghat district, Central Provinces. Produces the real Hingunghat cotton.

No. 292. Hingunghat cotton. Khandeish.
Grown in Khandeish. Better kinds from Fezpoor and Julgaum, in North-east Khandeish, class with Oomrawuttee. Liverpool quotation for this sample 9½*d.* per lb., or Rs. 285 per candy in Bombay, on 16th March, 1872; ordinary Fezpoor on same date, Rs. 265 per candy.

Broach and Surat Class of Cotton.

294–300. Samples of seed-cotton and cotton from Sind, Broach, and Surat.

Exotic and Miscellaneous Class of Cotton.

301–315. Specimens of Tanjore, Tinnevelly, Bourbon, Peruvian, and Egyptian cotton and seed-cotton, from Sind and Khandeish.

No. 304. Cotton; Peruvian. Khandeish.
Grown in Khandeish; soil manured with fertilizer (coffee-manure, Poonac), sent from Ceylon by order of H. E. Sir Seymour Fitzgerald. Colour good; staple good and fine; last season's cotton. Probable value, Rs. 324 per candy.

No. 315. Cotton; Egyptian. Khandeish.
Grown in Khandeish in 1870–71 on land manured with the Ceylon fertilizer (coffee-manure, called Poonac); tried by order of H. E. Sir Seymour Fitzgerald. Discoloured by rain; except for this it would probably have been worth 1*s.* in Liverpool. Staple in length and fineness considered by the valuer equal to that of Egyptian itself. Probable value, Rs. 333 per candy.

Foreign Cotton brought to Indian markets.

316–318. Samples of Shiraz, Bushire, and Ispahan cotton. Specimens illustrating the method of packing samples.

319–330. Verawul, Coompta, Dhollerah, Bhownuggur Dhollerah, Saw-ginned Dharwar American, Barsee Oomrawuttee, Fezpoor Oomrawuttee, Oomrawuttee, Akote, Native-ginned Broach, Macarthy-ginned Broach, and Hingunghat cotton.

Major A. T. Moore V.C., Acting Cotton commissioner, Bombay.

331–349. Collection of cotton-seed, seed-cotton, and cleaned cotton from the Government Farm, Broach.

350–358. Collection of cotton-seed, seed-cotton, and cotton from the Government Farm, Dharwar.
These samples, from the Government farms, Koosegul, Dharwar, are all of last season's crop, the new crop not being ready. They do not fairly represent the last season's produce on the farm, the larger and superior portion of which had been disposed of when the collection was made.

Nos. 350–353. Samples of indigenous or Coompta and Broach cotton-seed and seed-cotton.

No. 354. Coompta cotton; Dharwar indigenous.

No. 355. Cotton; Broach variety.
Samples of Dharwar indigenous and Broach cotton were submitted to Messrs. Robertson, Brothers, of Dharwar, who described them as superior to any thing obtainable in the market.

New Orleans cotton (2 samples); acclimatized in Dharwar, and cleaned by the saw gin.
Messrs. Robertson, Brothers' opinion of this cotton is as follows :—"Weak staple, even in length of fibre, free of "cheep" (broken leaf), and good colour; better than can be had in the market.

Egyptain cotton.
Much injured in cleaning by the foot-roller, re-cleaned by the "pinjara." Merely sent to show length of staple. Messrs. Robertsons report it "dirty, much stained, and uneven in staple.

Sea Island cotton.
The remarks on previous sample apply also to this.

359–361. Seed-cotton, and cleaned cotton from the Government Farm, Dhurrungaum, Khandeish.

No. 359. Seed-cotton; Khandeish Hingunghat of this season.
Inferior to "kuppas" of ordinary seasons, owing to the failure of the monsoon rainfall having been less than half the average.

No. 360. Cotton; Malwa variety.
Commonly called "Waradee;" displaced in 1866–67, but not entirely exterminated. This season's growth.

No. 361. Cotton; Khandeish Hingunghat.
From pedigree seed selected for four seasons. Injured in quality by failure of rain; nevertheless a very good sample. This season's crop.

362–366. Cotton-seed, seed-cotton, and cotton from the Government Farm, Sind.

No. 362, 364. Cotton-seed and cotton; Sind variety; unselected.

Nos. 363, 365, 366. Seed-cotton and cotton; American, New Orleans; selected and unselected; grown on "Dussur" soil.

885. Seed-cotton. Indore Local Committee.

886. Ginned cotton. Indore Local Committee.

Models and Photographs of Machines for Cleaning Cotton, &c.

H. H. the Maharajah of Gwalior, G.C.S.I.

367. Model of cotton-cleaning machine. Punjab.

368. Cotton-cleaning machine. Gwalior.

369. The bow with its appendages, as used for cleaning cotton.

Berar Local Committee.

370, 371. Gins (2); for cleaning cotton. Berar.
379*a*–379*c*. Cotton Dokras and half-pressed and full-pressed cotton bales, from Berar.
381–446. Weeds found in the cotton fields; 60 specimens.
166–217. Seed-cotton (30 samples) and cleaned cotton (31 samples).
141–158. Cotton plants; dried and mounted; 18 specimens.

Nagpore Committee.

372. "Churka." Cotton gin. Nagpore.
159–165. Bolls of Coconada, Dharwar, Sheegaum, Jurree, Old Khandeish, Hingunghat, Bunnee, and Nankin cotton plants. Preserved in spirits.

Madras Committee.

373. "Churka." Madras.

Government of Bombay.

375. Foot-roller. Dharwar.
Used in cleaning or separating fibre from the seed of almost all the cotton known in the English market as Coompta. The foot-roller is used by a woman, who sits on the stool and rolls the iron rod quickly backwards and forwards with her feet on the stone. The seed-cotton is placed in front of the rod, which catches the fibre under it and separates it from the seed, which remains in front.

376. Foot-roller. Indapoor, Poona Collectorate.
Used in the Poona and Sholapoor districts for cleaning cotton.
377. Hand "Churka." Dharwar.
Full size. One-handle "churka" for ginning cotton. Only used in some of the southern parts of the Dharwar district for cleaning the indigenous or Coompta cotton.

378. Hand "Churka." Khandeish.
Scale of one half. Used throughout Khandeish, &c. In Malligaum, of the Nassick Collectorate, a one-handle or "ex-huthee" "churka" is used, which, however, differs from the Dharwar kind in having an iron and a wooden roller.

H. E Sir W. R. Seymour Fitzgerald, G.C.S.I.

545. Dharwar Saw-gin; model. Dharwar.
Used for ginning American cotton in Dharwar.
379. Pinjáras' Machine. Dharwar.
Used for "bowing" or preparing cotton for stuffing beds, cushions, &c., and also for making "hungees" or skeins of cotton-wool for spinning purposes. The cotton-wool prepared by this machine is made into "hungees" by rolling a portion in the hand on the thigh.

H. H. the Rao of Kutch G.C.S.I.

374. Cotton-cleaning machine. Kutch.

YARNS and TWISTS.

Government of Bombay.

447. Collection showing the processes and manufactures of the Jaffer Alli Spinning and Weaving Company at Surat.

R. Hyde Cheetham, Greaves Cotton Company, Bombay.

448. Specimens showing the process and manufactures of the Morarjee Goculdas Spinning and Weaving Company's Mill at Parell.
1. Cotton-mixing; the cotton in its first stage.
2. Cotton cleaned through the opener; 1st process.
3. Lap cleaned through the scutcher; 2nd process.
4. Web from the carding engine.
5. Sliver from the carding engine; 3rd process.
6. First sliver from drawing-frame.
7. Second sliver from drawing-frame.
8. Third sliver from drawing-frame.
9. Roller from drawing-frame.
10. Three bobbins from slubbing-frame.
11. Three bobbins from intermediate frame.
12. Two bobbins from roving-frame.
13. Six bobbins from throstle yarn finished: No. 30's, usually called water twist and used for warp.
14. Cops from mule No. 20's; yarns.
15. Cops from mule No. 26's; yarns.
16. Cops from mule No. 30's; yarns.
17. Mule yarn in bundles.
18. Throtle yarn, in bundles.
19. Yarn in knots.

Government of Bombay.

471. "Hungees" or cotton skeins. Cotton wool made into "hungees" by rolling between the palms of the hands, or on the thigh. Dharwar.
472–483. Samples of yarns or native twists from Sind, Dharwar, Khandeish, and Ahmedabad.

Collector of Etawah, N.W. Provinces.

484–485. Specimens of spun yarns.
486–487. Specimens of yarns. Manufactured by the Elgin Mills Company, Cawnpore, N.W. Provinces.

Rangoon Local Committee, Burmah.

488–491. Native twists spun in the Toungoo district and at Mingyan. Sample of European twist dyed in the Bassein district.

MODELS, PHOTOGRAPHS, &c. of MACHINES for SPINNING and WEAVING.

Berar Local Committee.

449, 455. Implement for winding yarn, and spinning wheel.

Government of the Punjab.

450, 462, 464. Models of spinning-wheel, spindle, and brush, from Delhi.

H.H. the Maharajah of Gwalior, G.C.S.I.

463. Model of tape-weaving machine. Gwalior.

Madras Committee.

457, 461. Spinning-wheel and model of loom, from Madras.

H. E. Sir W. R. Seymour Fitzgerald, G.C.S.I.

453, 454, 458, 460. Spinning-wheels from Dharwar, Khandeish, and Indapoor.
No. 458. "Rhat." Spinning-wheel. Dharwar.
Used for spinning cotton into thread, and for winding thread on spools for the shuttle. Full size.

No. 460. "Huthee;" with stand. Dharwar.
Used when spinning spools for the shuttle.

Government of Bombay.

467. "Modee;" in three pieces. Dharwar.
For making up hanks of thread for "kunkees" or small reels for weaving. The two blocks of wood are placed at a proper distance apart. The thread is then arranged round the pegs of one block to those of the other, and then wound off on to the third part, which is a "huthee" or hand-reel.

459. "Assara;" for winding twist. Khandeish.
For arranging thread in hanks or skein. Scale of one-half.

452. "Tanvat." Poona.
For making up large hanks or skeins of twist for sale.

456. "Wuttee." Rope-making machine. Dharwar.

465. "Koonchee." Weaver's brush.
Weaver's brush, full size. Used along the twist or warp stretched on the "hoodiathur" or "tiotee" for removing dust, smoothing and arranging the threads, and equally distributing the size which has just been applied.

468–470. Models of the hand-looms, "Mag," in use in Surat, Khandeish, and Sind.

H. H. the Rao of Kutch, G.C.S.I.

451, 466. Machines for spinning and weaving, from Kutch.

Samples of Materials used for Dyeing.

Collector of Etawah, N.W. Provinces.

517–531. "Kussoom" (carthamus tinctorius), "Hurra" myrobalans, "Har singar" (flowers of weeping nyctanthes), "Kussees" (sulphus ferræ), "Majoophul" (gall nuts), "Dhak" (flowers of butea frondosa), "Anar" (pomegranate rind), "Huldee" (turmeric), Sujjee (mineral alkali), "Nil" (indigo, "Russee" (saline efflorescence from the earth, "Mooltanee mittee" (yellow ochre), "Gerroo" (red ochre), "Sootea" (blue vitriol), "Kutha."

532. Specimens of colours (26), produced from the above.

Collector of Cawnpore, N.W. Provinces.

533. "Aàl" root. Used for dyeing cloth.

Berar Local Committee.

534. Samples of dyes (5); used in Berar.

Dr. Bhau Daji, Bombay.

535. Four boxes of dyes. Used in the Western Presidency.

Dr. Bhau Daji furnishes the following notes on dyeing substances and processes as used and practised in Western India:—

The art of dyeing is in its infancy in this country. It is rudely practised, and is capable of much improvement. The colours imparted are of great variety, but they are generally not permanent. This is owing to the sad want of chemical knowledge. The mordant principally used is alum; the use of the salts of tin and lead is entirely unknown to native dyers. All the shades of red, from scarlet downwards, produced from safflower are not permanent, from there being no mordant known which fixes its colour. The colours obtained from madder and indigo are generally permanent, but in brightness they are inferior to dyes from Europe.

The majority of substances used in dyeing are produced from the vegetable kingdom, a few only being minerals.

The apparatus employed is simple and inexpensive. A few pans, earthen pots, and jars, and cloth filters constitute the principal items in a dyer's workshop.

The following is a list of the colours commonly produced on cotton cloth, and of the substances used in the production of each:—

"Kusumbi" (crimson). Not permanent. Articles used are: safflower and lime juice. A watery infusion of the safflower being prepared, to it lime juice is added, and the cloth steeped and dyed therein.

"Gulinar" (like the flower of the pomegranate—scarlet). Not permanent. Articles used: safflower, the yellow part of the flower of *nyctanthes arbortristis*, and lime juice. Process: the wet cloth is steeped in a cold watery solution of safflower, then dried, next steeped in a solution of nyctanthes flowers, to which lime juice is added.

"Gulabi" (pale rose colour). Not permanent. Articles used: safflower and lime juice. Process: the wetted cloth steeped in a mixed solution of safflower and lime juice.

"Phula-Gulabi" (rose colour). Not permanent. Articles used: safflower and lime juice. Process: steep the wetted cloth firstly in a solution of safflower, and afterwards in a solution of lime juice. Then dry.

"Kirinaji" (kermez colour). Not permanent. Articles used: safflower, kermez, lime juice, and tamarisk galls. Process: steep the cloth in solution of safflower, dry, and steep in decoction of kermez, to which lime juice and tamarisk gall decoction is added; then dry.

"Kirsani" (very pale lilac colour). Not permanent. Articles used: safflower, indigo, and lime juice. Process: the cloth is first steeped in a solution of safflower, then in a dilute solution of indigo, and lastly in dilute lime juice.

"Jambali" (purple). Not permanent. Articles used: indigo, safflower, and lime juice. Process: the cloth is steeped in solution of indigo, then in solution of safflower, to which lime juice is added.

"Abasahi" (purple, with a shade of blue). Not permanent. Articles used: safflower, indigo, and lime juice, or its substitute, dried mangoes. Process: the cloth is steeped in a solution of safflower, to which indigo and lime juice is afterwards added.

"Badami" (almond shell colour). Not permanent. Articles used: safflower, turmeric, flowers of butea frondosa, and lime juice. Process: the cloth is first dyed in safflower solution, then in that of turmeric, then in lime juice, and lastly in solution of butea flowers, each solution being treated separately.

"Motiya" (very pale pink). Not permanent. Articles used: safflower and lime

juice. Process: the cloth is dyed in safflower solution, to which lime juice is added.

"Galino" (indigo blue). Colour permanent. Articles used: indigo and impure carbonate of soda. Process: a cold watery solution of indigo and carbonate of soda being prepared, the wetted cloth is steeped therein.

"Katavo" (charcoal black). Permanent. Articles used: indigo and sulphate of iron. Process: the indigo is dissolved in an aqueous solution of sulphate of iron in a proper vat, and the cloth is steeped in it for a day or two; during the steeping the cloth is frequently shifted.

"Lilo Galino" (indigo green). Permanent. Articles used: turmeric and indigo solution. Process: steep in solution of indigo, and then in that of turmeric.

"Asmani" (sky blue). Not permanent. Articles used: indigo solution and alum. Process: steep in solution of indigo, to which alum is afterwards added.

"Lala Majithyo" (madder colour). Permanent. Articles used: madder, flowers of grislea tomentosa, alum, and myrobolans. Process: steep the cloth in decoction of myrobolans, dry and wash it, then steep in alum solution and wash, then steep in a mixed decoction of madder and grislea flowers, wash and dry.

"Lala Surangi" (surangi red). Permanent. Articles used: surangi (root of morinda citrifolia), goat's dung, myrobolans, alum, castor oil, impure carbonate of soda, and tamarisk galls. Process: steep the cloth in a solution of goat's dung and wash, then steep in a decoction of myrobolans, next in alum, and then in oil, and keep there for eight days; make a cold infusion of morinda root and tamarisk gall, and steep in it for two days.

"Patangya." Not permanent. Articles used: sappan wood (cæsalpinia sappan), alum, myrobolans, and carbonate of soda. Process: steep in solution of alum and myrobolans, and dry; then steep in decoction of sappan wood, to which carbonate of soda is added.

"Lakhano" (pink from lac). Not permanent. Articles used: lac, bark of symplocos racemosa, and alum. Process: steep in solution of alum, and dry. Stick lac and symplocos bark are pounded, and their decoction being prepared, the cloth is steeped and dried.

"Kapilo" (orange yellow). Permanent colour. Articles used: "kapilo" (the powder from the capsule of rottlera tinctoria), kermez, and alum. Process: steep the cloth in a decoction of the above; then wash and dry.

"Soneri" (golden yellow). Not permanent. Articles used: old roots of turmeric, carbonate of soda, safflower, and alum. Process: prepare a decoction of turmeric, to which soda is added; steep the cloth in, wash, and steep in a solution of safflower; and lastly steep in a solution of alum, and dry.

"Kesari" (saffron yellow). Not permanent. Articles used: flowers of carthamus tinctorius and carbonate of soda. Process: steep in a decoction of butea flowers with soda added; wash and dry.

"Pilo" (yellow of Ispung). Not permanent. Articles used: isparak (flowers of a species of delphinium from Cabul), carbonate of soda, and lime juice. Process: steep for two hours in a solution of delphinium flowers, with soda added, then steep in a solution of lime juice, and dry.

"Kapasi" (pale yellow, colour of the cotton plant flower). Not permanent. Articles used: flowers of butea frondosa, lime juice, and turmeric. Process: steep in decoction of the flowers, then in that of turmeric, and lastly in lime juice.

"Totai" ("parrot green"). Not permanent. Articles used: verdigris, turmeric, and lime juice. Process: steep in solution of verdigris, then in that of turmeric with lime juice added.

"Halako popati" (pale parrot green). Not permanent. Articles used: turmeric, blue vitriol, and lime juice. Process: steep the cloth in the various solutions separately.

"Pirozo" (Turkish blue). Permanent. Articles used: blue vitriol and carbonate of soda. Process: steep in solution of soda, and lastly in that of blue vitriol.

"Khaki" (ash colour). Permanent. Articles used: green vitriol and carbonate of soda. Process: steep in solution of green vitriol, and then in that of carbonate of soda.

"Tapakiri" (snuff colour). Permanent. Articles used: catechu and carbonate of soda. Process: steep in cold solution of catechu and soda for two days, then dry.

Tools and Implements used in Superficial Ornamentation.

Government of the Punjab.

536. Models of stamps used in cotton printing (12). Shahpoor, Punjab.

Collector of Cawnpore, N.W. Provinces.

537. Stamps (18); "Chapa;" for stamping designs on textile fabrics.

538. Stamps (15); for stamping designs on textile fabrics, with specimens of chintz printed therefrom.

Berar Local Committee

539. Samples (16) of blocks used for printing on textiles, with impressions on cloth. Berar.

Government of Bombay.

540. Printing blocks or stamps (112). Dharwar "Chapas" or printing blocks used in the Dharwar district, with samples of impressions.

Materials for Manufacturing Processes.

Government of Bombay.

542. Bundle of stalks of the Hingunghat cotton plant. Khandeish.

Berar Local Committee.

543. Baskets; made from cotton sticks. Berar.

Nagpore Committee.

Fibre of cotton plants. Nagpore.

APPAREL for HEAD-WEAR.

Government of Bombay.

621. Turban; white. Pahlunpoor.
622. "Roomal;" black; English twist. Dharwar.
613. "Bhoorka." Veil. Worn by Khoja, Persian, and other women, in public. Bombay.
614. "Bhoorka." Veil. Worn by Borah women in public. Bombay.
615. "Petti." Worn by Parsee women. Bombay.

APPAREL for BODY-WEAR.

Collector of Benares.

626. "Saree"; black; flowered borders, Baboo Dabee Persaud, Benares.

COLLECTION of COTTON ARTICLES of APPAREL from BOMBAY.

Government of Bombay.

627. Brahminical thread. "Janve." Khandeish.
Made of country twist by Brahmins, and worn as the sacred thread over the left shoulder, and passing under the right arm. Each thread consists of nine strands. The investiture with the thread takes place at the ceremony called "moonj" which is generally solemnized at the age of eight or nine years. The sacred cotton "deo kupas," or "nurma" (Gossypium arboreum), is preferred for making the "janve," but is seldom procurable. The thread is renewed every year in the month of Shravun.

628. Brahminical threads; country twist. Kattyawar and Dharwar.
629. Brahminical thread. "Shivderee." Dharwar.
Made of native cotton, and worn by Lingayats alone. The gold or silver box containing the "ling," or "lingum" (emblematic of Shiva, or Mahadeo), is suspended on the breast by means of this thread or cord.

630. "Nadas;" coloured. Dharwar.
Tied by Mahomedans on their wrists, or around their necks during the Mohurrun festival, when mourning is observed for ten days in remembrance of the first alleged martyrs of the Shiah Mussulmans (Hussan and Hoosein). The "nadas" are worn for the ten days, and are then thrown into the sea along with the "taboots" or biers, which are carried in procession on the occasion.

631, 631a, 631b. Purses; "Wasnees" (7); country twist. Worn around the waist. Sind and Kattyawar.
632. Purses. "Cheelas." Used by travellers. Dharwar.
633. Bags. "Chunchees" and "Butwas." Used as money bags, and in daily use as receptacles for betel leaves, &c. Dharwar.
623. "Purrahs." Female under-garment. Sind.
617. Kerchiefs (8 in a piece). Used by both sexes as shawls or ornamental waistbands. Dharwar.
625. "Saree;" black; red border. Khandeish.
620. "Choonree;" red; gold borders; knotted dyed work. An example showing the different stages in the process of knot-dyeing. Kattyawar.
546. "Lungotee," "Khadi" or "Dungry." Worn by lower classes. Dharwar.
547, 547a. "Churdei" or "Maud Cholna" (4). Kind of short trousers worn by peasantry. Dharwar.
548. "Izar." Trowser. Worn by lower order of Carnatic Ryots. Dharwar.
549. "Cholna" or "Soorwar." Worn by children in Kattyawar. Bombay.
550. "Izar." Worn by children of Purbhoos, &c. Bombay.
551. "Izar." Worn by Mussulmans. Bombay.
552. "Izar." Worn by Mussulmans of the Konkan. Bombay.
553. "Pyjama" (a tight trowsers). Worn by Sepoys and peons. Bombay.
554. "Izar." Worn by Borahs. Bombay.
555. "Lhengo" (trowsers). Worn by male Khojas, Memons, &c. Bombay.
556, 556a. "Lhengos" (2). Worn by male Parsees in Bombay. Bombay.
557. "Izar." Worn by female Borahs. Bombay.
558. "Paron." Shirt. Worn by male convicts, Dharwar Jail. Bombay.
559. "Paron." Worn by Mahomedan children. Bombay.
560. "Sudra." Worn by male Parsees of Bombay. Bombay.
561, 561a. "Parons" (2). Worn by male Mahomedans. Bombay.
562. "Bundee." Waistcoat. Worn by lower order in the Carnatic. Dharwar.
563. "Kubja." Waistcoat. Worn by Koonbees of Kattyawar. Bombay.
564. "Koodta." Waistcoat. Worn by Marathas of the Deccan. Bombay.
565. "Kubja." Waistcoat. Worn by Mussulmans of the Koncan. Bombay.
566. "Kedzoo." Waistcoat. Worn by Koonbees of Kattyawar. Bombay.
567. "Bundee." Waistcoat. Worn by people of Kattyawar. Bombay.
568. "Meerjai." Waistcoat. Worn by Purdasees of Hindustan. Bombay.
569. "Bundee." Waistcoat. Worn by Bhattias and other Hindus of Guzerat, Kattyawar, and Kutch.
570. "Bundee." Worn by Purbhoos and others of Bombay. Bombay.
571. "Sudria." Waistcoat. Worn by Mahomedans. Bombay.
572. "Sudria." Worn by Borahs. Bombay.
573, 573a. "Bunyans" Waistcoats (2). Worn by Parsees, Bunnias, &c. Bombay.
574. Button waistcoat. Worn by Parsees, Bunnias, &c. Bombay.
575, 575a. "Sudrias" (2). Worn by Mahomedans. Bombay.
576. "Khedzoo." Jacket. Worn by children in Kattyawar. Bombay.
577. "Angia" Coat. Worn by lower orders in the Carnatic. Dharwar.
578. "Angurkha." Coat. Worn by Ghattees of the Deccan. Bombay.
579. "Khedzoo." Coat. Worn by Kattyawar fisherman. Bombay.
580. "Angurkha." Coat. Worn by Marwarees. Bombay.
581. "Angurkha," "Rao Shai." Coat. Worn by Kattyawar people. Bombay.
582. "Angurkha," "Kutchee." Coat. Worn by people of Kutch. Bombay.
583. "Angurkha." Worn by Purdasees. Bombay.
584. "Angurkha," "Scindheshai." Worn by Hindus of the Deccan. Bombay.
Originally used by Brahmins only; chief dress of Gwalior rulers.

585. "Angurkha," "Poonashai." Worn by people of Poona. Bombay.
586. "Angurkha;" with long sleeves. Worn by people of Poona. Bombay.
587. "Angurkha." Worn by Parsees, Bunnias, &c. Bombay.
588. "Angurkha." Worn by Purbhoos of Bombay, &c. Bombay.
589. "Angurkha." Worn by Kinkaree Mahomedans. Bombay.
590. "Angurkha." Worn by Borahs. Bombay.
591. "Angurkha." Worn by young people in Bombay. Bombay.
592, 592a. "Sayas." Coats (3). Worn by Mahomedans. Bombay.
593. "Jama;" robe. Worn by Bunnias, Parsees, Purbhoos, and others of Bombay at marriages; the Parsees use it also at funerals. Bombay.
594. "Cholee." Bodice used by female convicts in Dharwar Jail. Dharwar.
595. "Cholee." Worn by Lumanees, or gipsy women. Dharwar.
596, 596a. "Cholees" (2). Worn by women of Kattyawar. Bombay.
597. "Kutoreechee Cholee." Worn by females of Kattyawar, Mooltan, &c. Bombay.
The ornamentation of this bodice piece is effected by stamping, the composition used being a mixture of white lead, linseed oil boiled with pitch, or some other resinous substance. It is difficult to ascertain the real nature of the composition, as the manufacturers are unwilling to disclose the secret of making it.
598. "Kauchlee Cholee." Worn in Kattyawar, Kutch, and Gujerat. Bombay.
599. "Cholee." Worn by Hindu women of all classes. Bombay.
600. "Cholee kudachee." Worn by Brahmin and other women. Bombay.
601. "Cholee kudachee." Worn by milkwomen of Hindustan and Poona. Bombay.
602, 602a. "Cholees" (2); green and black. Worn Hindu women. Dharwar.
603. "Kutoree Cholee;" gold border. Bombay.
604. "Ghagra." Petticoat. Worn by Lumanees of the Carnatic. Dharwar.
605. "Ghagra." Worn by females of Kutch, Kattyawar, Guzerat, Sind, &c. Bombay.
606. "Ghagras" (2). Worn by Bunnias and Mahomedan women. Bombay.
607. "Ghagra." Worn by Marwaree women. Bombay.
608. "Sootna." Trowsers. Worn by Khoja females. Bombay.
609. "Paron." Shirt. Worn by Marwaree women. Bombay.
610. "Paron." Worn by Khoja and Mahomedan women. Bombay.
611. "Chadur." Worn by Kurkanee women in public. Bombay.
612. "Paron" or "Sudra." Worn by Parsee females. Bombay.
616. "Angeeas" (2). Worn by children of the Carnatic. Dharwar.

COTTON GOODS from BOMBAY.

Gerald S. V. Fitzgerald, Bombay.

624. "Bunnad Huchoda." Used as a covering at night.

COTTON GOODS from SIND.

Rangoon Committee.

634. Mosquito curtain. "Chin Doung." Burmah.

COTTON GOODS from BERAR.

Berar Local Committee.

492, 493. Samples (42) of native made cloth.

COLLECTION of COTTON GOODS contributed by the Government of BOMBAY.

Bombay Committee.

494. Cord; thick white; country twist. Used for tents and various other purposes. Sind.
495. Strings of cotton; country twist. Used for various purposes. Sind.
496. Ropes; of sorts; country twist. Used for various purposes. Dhoolia and Surat.
497. Ropes, of sorts; English and country twist. Used for driving bullocks and other purposes. Sind.
498. Nose ropes. "Nuthrees" (4). Used for driving bullocks; passed through the nostrils. Dharwar.
499. Horn ropes. "Hankats" (5); attached to the horns of bullocks for driving. Dharwar.
500. Whips. "Koledans" (3); bullock whips. Dharwar.
501. Whips. "Barkoles" (3); bullock whips. Dharwar.
502. Reins. "Lugams" (3); used as reins for horses; the portion held in the hand is also used as a whip. Dharwar.
503. Straps (2 pairs). Used to yoke bullocks. Dharwar.
504. Fishing net. Khandeish.
505. Cruppers. "Doomchees." Used for fastening the native saddle. Dharwar.
506. "Mukhears;" coloured. Used to protect horses' eyes from flies, &c. Sind.
507. Horse trappings; coloured (1 set). Made of English twist. Sind.
508. Camel gear; coloured (1 set). Sind.
509–515. Cotton tapes; white and coloured; used for various purposes. From Sind, Dhoolia, Dharwar, Kattyawar, Surat, and Ahmedabad.
516. Sacking material. "Khundadee." Dharwar.
618. Bullock covers. "Zooles." Sholapoor.
639. Bullock cover. "Zool;" Kharwar cloth. Dharwar.
619. Flag. "Nisham;" attached to a stick, is carried by Hindu pilgrims. Dharwar.

A SERIES OF PHOTOGRAPHS ILLUSTRATING THE CULTIVATION, PREPARATION, AND MANUFACTURE OF COTTON IN WESTERN INDIA.

(14 FRAMES.)

FRAME I.

Government of Bombay.

PHOTOGRAPHS (12) of AGRICULTURAL IMPLEMENTS. Used in COTTON CULTURE in WESTERN INDIA.

Digging and weeding tools. Mr. Sheoshankar Narayan, Bombay.

a. "Powda."
Performs all the services of an English spade.

b. and *d.* "Khodala;" small and large.
A kind of pick used for digging.

c. "Khurdee."
Used for lopping off branches of prickly pear, &c.

e. "Kowaree." Hatchet.

f. and *g.* "Dathurdee." Weeding-hooks.

Field implements. Mr. Sheoshankar Narayan, Bombay.

1. "Hul." Common plough.
2. "Kurub."
A kind of scraper used for pulverizing the surface of the ground previous to sowing the seed.
3. "Phurko." Sowing-machine.
4. "Kurblee."
Small scraper, used for clearing off weeds from between the lines of plants.

1 *b.* Plough. Mr. W. G. Stretton, Bombay.
This is the common native plough drawn by a pair of bullocks. It is used throughout Kattyawar.

b. Implements.
A few of the common implements used by the cultivators of the province.

"Gadu." Mr. Sheoshankar Narayan, Bombay.
A village cart used for the conveyance of "kuppas" (seed-cotton), and all kinds of loose materials. The bullocks are of the pure Gujarat breed.

"Hul." Plough. Mr. Sheoshankar Narayan, Bombay.
Consists of a simple steel point rivetted on to a wooden boot, and is capable of cultivating the soil to a depth of four to six inches. The driver is of the Borah caste, considered to be the best cultivators in Gujarat.

"Hul." Plough. Mr. Sheoshankar Narayan, Bombay.
The driver in this case is a Bheel, one of the aborigines of the Gujarat jungles.

FRAME II.

Native ploughs at work. Messrs. Michie and Co., Kurrachee.

"Sumar." Clod-crusher. Mr. Sheoshankar Narayan, Bombay.
A large piece of the heaviest timber obtainable, which is dragged by bullocks over the newly turned-up ground for the purpose of breaking it sufficiently fine to admit of its being sown.

"Phurko." Sowing-machine. Mr. Sheoshankar Narayan, Bombay.
Consists of two perpendicularly fixed bamboo cylinders surmounted by a wooden bowl, into which the seed is dropped from the hand of the feeder seen on the left. The lower end of the cylinders are fixed in small coulters, which make furrows, of any required depth, into which the seed drops.

"Kurblee." Scraper. Mr. Sheoshankar Narayan, Bombay.
Shewn at work between the lines of young cotton plants.

Persian water-wheel; worked by a camel. Messrs. Michie & Co., Kurrachee.

PHOTOGRAPHS illustrating COTTON CULTURE in BERAR.

FRAME III.

Berar Local Committee.

Native heavy plough.
Surface ploughing.
Sowing.
The Buckhur.
Cotton cleaned by the hand churka.

FRAME IV.

Camels loaded with cotton.
Native carts with cotton.
Cotton cleaned by Macarthy's gins.
Cotton market.
Bullocks loaded with cotton.

FRAME V.

Group of cotton buyers. Khangaum, Berar.
Cotton in docras and fully-pressed bales. Khangaum.
Sampling and weighing cotton. Oomraottee, Berar.
Half-pressing bales. Khangaum, Berar.
Sampling and weighing cotton. Khangaum, Berar.

FRAME VI.

Full-pressed bales. Khangaum, Berar.
Full-pressed bales leaving Oomraotte, Berar.
Cotton in docra. Khangaum, Berar.
Breul's Cotton Pressing Co. Oomraottee, Berar.
Cotton in docra. Oomraottee, Berar.

FRAME VII.

Government of Bombay.

PHOTOGRAPHS (20) of INDIGENOUS and EXOTIC VARIETIES of COTTON grown in WESTERN INDIA.

Cotton plant; Broach; native variety. Mr. Sheoshankar Narayan, Bombay.
Showing the dimensions to which the plant will grow in a favourable situation and with abundance of water. The number of ripe and unripe pods and flowers on this plant was 460.

Cotton plant; Broach; native variety. Mr. Sheoshankar Narayan, Bombay.
Usual size of the plant when grown in the ordinary way in the open field.

Cotton plant; Hingunghat variety. Mr. Sheoshankar Narayan, Bombay.
Grown at Broach. Inferior in every respect to the local variety.

Cotton plants; Egyptian variety. Mr. Sheoshankar Narayan, Bombay.
Grown at Broach. Succeeds only in a garden or sheltered field.

Cotton plant; New Orleans variety. Mr. Sheoshankar Narayan, Bombay.
Grown at Broach; ripens remarkably well except in very cold wet seasons, but is invariably much damaged by insects.

Cotton plants; Hybrid between New Orleans and Egyptian varieties. Mr. Sheoshankar Narayan, Bombay.
It was produced in season 1870-71, and seems to have a much hardier constitution then either parent, the produce at the same time being equal in quality.

Cotton plant; Bourbon variety. Mr. Sheoshankar Narayan, Bombay.
Grown at Broach; succeeds pretty well, but yields a weak and worthless fibre.

Cotton plant; Broach; native. Messrs. Michie & Co., Kurrachee.

Cotton plant; Sind; native. Messrs. Michie & Co., Kurrachee.

FRAME VIII.

Cotton plant; Opoom; Tinnevelly. Messrs. Michie & Co., Kurrachee.

Cotton plant; Tanjore. Messrs. Michie & Co., Kurrachee.

Cotton plant; Hingunghat. Messrs. Michie & Co., Kurrachee.

Cotton plant; Dharwar; native. Messrs. Michie & Co., Kurrachee.

Cotton plant; American. Messrs. Michie & Co., Kurrachee.

Cotton plant; Egyptian. Messrs. Michie & Co., Kurrachee.

Cotton plant; Bourbon. Messrs. Michie & Co., Kurrachee.

Cotton plant; Nankin. Messrs. Michie & Co., Kurrachee.

Cotton plant; Peruvian. Messrs. Michie & Co., Kurrachee.

FRAME IX.

The cotton plant in flower. Mr. W. G. Stretton, Bombay.
This represents the cotton plant in flower; the latter is a pale yellow in colour and of an elegant shape. The flowering generally commences in December.

The cotton plant in pod. Mr. W. G. Stretton, Bombay.
This represents the "lallioo" plant ripe and ready for picking, the pods having fairly burst.

Views (4) of cotton districts in Western India :—

Cotton field. Mr. W. G. Stretton, Bombay.
This represents part of a "dhankanioo" cotton-field nearly ready for picking, the figures in the foreground having only been introduced to give an idea of the mode of picking. The four are supposed to be in line, and to form a portion of a vast band extending far away to the right and left according to the size of the field. It will be observed that the "dhankanioo" cotton remains tightly enclosed in the pods, the latter not bursting so fully as in the case of "lallioo."

Picking the cotton. Mr. W. G. Stretton, Bombay.
This takes place in the end of January or beginning of February; men, women, and children are employed, the former superintend the operation. The pickers commence at one end of the field and traverse it in line, picking as they go, and placing what they pick in a cloth, which they tie in the form of a bag on their backs. The "lackoo" cotton is separated from the pods by the pickers in the field, as it naturally falls out owing to the pods bursting. The "dhankanioo" cotton, on the other hand, remains tightly enclosed in the pods, which are therefore picked whole, the separation taking place afterwards under shelter. Three separate pickings take place when the crop is a good one.

Cotton field. Mr. Sheoshankar Narayan, Bombay.
Showing the pickers at work. The quantity gathered during the day is carried home in the evening in bundles on the head. The work is paid for by weight.

Cart of "Kuppas" reaching market. Mr. Sheoshankar Narayan, Bombay.
This shows the manner in which it is brought in from long distances; the merchant by the side of the cart is examining a sample and trying to come to terms with the owners.

FRAME X.

PHOTOGRAPHS (6). ILLUSTRATING the PREPARATION of COTTON for MANUFACTURE.

The "Charpaie." Mr. Sheoshankar Narayan, Bombay.
This shows the process by which dirty "kuppas" is cleared of earth and other substances. The frame is wrought in with a network of strong cords, upon which the "kuppas" is laid; it is then beaten with crooked sticks, which causes the rubbish to drop on the ground.

Pickers. Mr. Sheoshankar Narayan, Bombay.
The "kuppas" sometimes gets mixed up with straw, leaves, and other rubbish. In such cases it is partially picked out by hand (as shown in the picture), to render the stuff saleable.

Separation of seed and fibre. Mr. W. G. Stretton, Bombay.
This represents the "churka" or machine used in Kattyawar for separating the fibre from the seed. It is worked by two persons; one turns the handle and feeds, whilst the other turns the wheel; and for the latter operation a purchase is obtained by driving a peg into the ground, and, with a small connecting rod, which is attached to it and the wheel, a marvellous velocity is acquired. The foot of the machine is fixed into a hole in the wall, whilst a couple of rods help to keep it steady. It certainly does its work uncommonly well; extreme simplicity is its chief recommendation.

The "Churka." Mr. Sheoshankar Narayan, Bombay.
A machine used for the purpose of separating the seed from the fibre. It consists of an iron spindle laid horizontally on a wooden roller;

the former is turned at great speed by the women on the left, while the feeder with his right hand guides the latter.

Women working on foot-rollers. Dharwar.
Cotton cleaning in the Southern Maratha country. This view represents a number of women in the act of using the "foot-roller," the only appliance used up to this date for cleaning, *i.e.*, disengaging the seed from the fibre, usually termed ginning; the class of cotton treated by this implement is the native indigenous, termed in the English market *Compta*. The implements consist of a round bar of iron about 14 inches long and $\frac{5}{8}$ inches diameter, tapering from the centre towards each end, and a piece of close-grained stone 8″ ×6″ ×3″. Motion is given to the roller on the stone by the feet, pressing on a piece of wood under each sole bearing on the roller; while one hand is engaged in passing the raw material and removing the seed in the front side, the other is removing the clean cotton from the back of the roller. The quantity of seed cotton cleaned per day equals about one *maund* or 25 lbs. yielding about 7 lbs. of clean cotton at a cost of two annas, equal to nearly 3*d*. in English money.

Cotton press and cattle-power machine.
Used in the Dharwar factory.

Frame XI.

The "Vakhar," Churka-yard. Mr. Sheoshankar Narayan, Bombay.
The "churkas" are seen at work under the roof of tiles which surrounds and encloses the yard. The "kuppas" is first spread out on the ground in the sun and beaten with crooked sticks, which greatly assists the working of the machine.

Photographs (6) of Machinery. Used for Cleaning Cotton.

Interior view of a steam-power ginning factory. Mr. Sheoshankar Narayan, Bombay.

Interior view of a steam-power ginning factory. Mr. Sheoshankar Narayan, Bombay.
Showing the manner in which the machines are fed.

Cattle power. Dharwar.
Designed for the purpose of superseding manual labour for driving the saw-gins. It has been found that a saving of 50 per cent. would be realized by the introduction of this machine for working the gins.

Cotton gins. Dharwar.
d. The Albion.
e. The American eagle.
f. Emery American saw-gins.
These three machines are American patent saw-gins not used; *d* and *e* are constructed with wooden framework, which is very objectionable.

Cotton gins. Dharwar.
a. Not used.
b. Dr. Forbes' "churka."
c. Dharwar saw-gin.
a. Represents a 25 saw-gins, without the maker's name; not used in the districts.
b. Dr. Forbes' hand churka, not used.
c. A Dharwan 18 saw-gin; for these gins, all the iron-work is sent out from England; the woodwork for the box and flues is prepared at the factory. Each machine is carefully tested in the experimental room before it is delivered to the purchaser; and a report of the result is recorded in the factory. These machines are used in the district for cleaning the acclimatized American cotton, which is cultivated to a great extent in this part of the country. Driven by manual labour, and generally fitted in a part of the ryot's house divided off for the purpose. Eight men are required to work the 18 saw-gin, that is, four at a time. The motion given by a driving wheel 5 ft. diameter. The out-turn of clean cotton equals from 11 to 12 maunds of 28 lbs. per day, at a cost of Rs. 3.

Cotton gins.
g. Platt's power "churka," not in use.
h. Macarthy gin; this machine is used for cleaning native cotton in Goojerat and the Berar districts, and in several other parts of India, worked by steam power, and is considered a very superior machine.

Frame XII.

Packing of Cotton into Bales.

Half-press. Mr. Sheoshankar Narayan, Bombay.
This is the wooden screw press used in packing cotton up-country. One man is seen carrying cotton on his head, while four others are treading it into the box, only the lower half of which is fixed.

Half-press. Mr. Sheoshankar Narayan, Bombay.
The men are here shown turning the screws with levers in the act of pressing.

Half-press. Mr. Sheoshankar Narayan, Bombay.
In this picture the process is further advanced, the cross-beam having descended to the top of the box.

Half-press. Mr. Sheoshankar Narayan, Bombay.
Showing the bale roped and ready for removal.

Bale cart. Mr. Sheoshankar Narayan, Bombay.
Conveying the bales from the press.

Frame XIII.

Photographs (16). Illustrating Processes of Manufacture of Cotton Fabrics.

"Pinjar." Mr. W. G. Stretton, Bombay.
This apparatus is curious and complicated. It is worked in a small room, but almost in the dark, as the chief point is to exclude the wind, and glass is unknown in such places. The cotton is operated upon twice, and it is then ready to be made up into rolls handy for the spinner. When being whipped up, the cotton resembles nothing so much as sand lightly falling. The woman makes the rolls with the assistance of a small stick.

"Pinjara." Cotton-cleaner. Messrs. Michie & Co., Kurrachee.
Same as No. 2879.

"Pinjun." Cotton-cleaner. Mr. Sheoshankar Narrayan, Bombay.
Same as above.

"Raintea." Spinning-wheel. Mr. Sheoshankar Narayan, Bombay.

The woman on the right cards the cotton into rolls and hands them to the spinner; after the bobbin is full the yarn is re-wound on to a swift.

"Raintea." Spinning-wheel. Mr. W. G. Stretton, Bombay.

The wheel is turned by means of a handle with the right hand, whilst with the left, which holds the cotton, the thread is spun on to the reel.

Yarn-winding Machine. Mr. Sheoshankar Narayan, Bombay.

This shows the process of winding the yarn from the bobbin in preparation for reeling; the axle of the swift is placed perpendicularly on the ground, and kept in rapid motion by a dexterous touch of the third and fourth fingers of the left hand.

Machine preparing thread for the loom. Mr. W. G. Stretton, Bombay.

The thread when taken off the spinning-reel is wound on to a larger reel, which is held in the left hand. Five small stakes are driven into the ground, No. 1, being the starting point, is rather shorter than the other four, which are placed in the form of a square. The unwinding then commences from No. 1 stake, and passes round the other four, first under, then over, back to No. 1, and so on until the whole is reeled off into the form of a skein ready for the cleaner.

Reeling machine. Mr. Sheoshankar Narayan, Bombay.

The thread when taken off the spinning-reel is wound on to a larger reel, which is held in the left hand. Five short stakes are placed in the ground, the distance apart being regulated by the required length of the skein.

FRAME XIV.

Dressing the skein. Mr. Sheoshankar Narayan, Bombay.

The starch or size (usually of coarse flour) is laid on with a small broom made of date-tree leaves; a large brush made of cocoa-nut fibre is then applied backwards and forwards along the threads until the whole is distributed.

Cleaning the thread. Mr. W. G. Stretton, Bombay.

A skein containing the requisite number of threads is fastened firmly to fixed points, and, being separated by small sticks, is supported by cross-sticks, somewhat in the fashion of a tight rope. The cleaner then takes his brush, which is made of cocoa-nut fibre, and dipping it in a preparation of flour and water passes it steadily up and down the entire length of the skein, using at the same time one of the small dividing sticks to facilitate the operation.

Photograph, showing the process of starching the yarn previous to weaving. Messrs. Michie & Co., Kurrachee.

The loom. "Sal." Mr. Sheoshankar Narayan, Bombay.

The lower half of the weaver's body is in a hole at the bottom, at which the treadles are worked. As the cloth is manufactured it is wound on the beam by slightly easing the rope on the right hand and turning round the lever.

The weaver. Mr. W. G. Stretton, Bombay.

Represents the weaver sitting on the ground with his legs in a kind of well or hole sufficiently large to contain the lower portion of the machinery, which is worked on the pedal principle with the toes, the combs being supported by ropes attached to beams in the roof working over pulleys, and stretching down into the well to the toes of the weaver. In the weaver's right hand is the shuttle, which contains the thread, and which, passed rapidly through the spaces created by the combs, forms the pattern. The principal comb is held in the left hand. In the making of elaborate cloths a boy assists, as the ropes and smaller combs are greatly increased in number, and the whole apparatus is much complicated.

Showing looms at work. Messrs. Michie & Co., Kurrachee.

Interior of Ahmed Hajee Abdoola's house at Kurrachee, showing looms at work.

Printing. Mr. Sheoshankar Narayan, Bombay.

This is done by wooden stamps, which are charged with the colouring matter, and applied one after the other as the design may require.

Dyeing. Mr. Sheoshankar Narayan, Bombay.

The vats are of clay, and built in as shown in the picture. The furnace goes right under the vat, the fuel used being the outer integument of the cocoa-nut.

B.—COTTON FABRICS.

Madras Committee.

A cotton head-cloth. Coimbatore.

"Saree." Dark cotton, with gold edging. Coimbatore.

"Saree." White, with gold lace. Madura.

The "Saree," the chief article of female attire in India, consists of a long shawl, which both envelopes the body and acts as a covering for the head. It is the common dress of Hindu women of all ranks, as well as that of a large proportion of Mahomedans. With respect to the materials of which the Saree is made, cotton naturally holds the first place, then mixtures of cotton and silk, silk itself, and lastly wool.

Dhotees (4). White; gold laced and plain. Madura.

The "Dhotee" is the usual male attire of the poorer classes of Mahomedans and Hindus. It consists simply of a piece of cloth which is wrapped round the loins.

"Packadi" or Cholee. Madura.

The "Cholee" is the bodice worn by Hindu and Mahomedan women, consisting of a closely fitting jacket with short sleeves.

A Zemindari cloth. Madura.
Piece of Arnee muslin. From Arnee.

Bombay Committee.

Turbans and head-cloths from Aden and Kattyawar.
Wrappers, variously coloured. From Aden.
Male and female attire, such as jackets, trowsers, waistcloths, shirts, petticoats, &c. from Kattyawar.
Cloth (6 pieces). With silk, gold, and embroidered borders. From Kattyawar.
Sarees (4). Made of cotton and silk mixture. Surat,
"Chole Khuns" or *mantle* pieces (5). From Dharwar.
"Sadlas," "Chiddrip," "Chowfals," &c. From Baroda and Dharwar.
Quilts (2). From Broach and Kattyawar.
Horse-cloth ("Jhool") and saddle-cover. From Kattyawar.
Cloth. From Dharwar Jail.
Thread, white and coloured. From Baroda.

Surat Sub-Committee.

Cotton shirting cloth (26 pieces).
"Loongees" (2). Mens' cloth.
A kind of scarf worn over the shoulder and upper parts of the body.
"Kornee." Girl's garment.
"Saree." Woman's cloth.
Bani cloth (3 pieces).
Table-cloth, sheeting-cloth, towels (3), &c. &c.

H. H. Meer Ali Moorad Khan, Khyrpoor.

"Khess" (7 pieces). Various patterns.
"Khess" is a cotton diaper much used by natives as a dress, and in demand by Europeans for table linen purposes. The fabric is generally woven in pieces, which are sewn together so as to form a square "chaddar" or upper wrapper, worn by all classes that can afford it.
"Soosee" (4 pieces).
This is a narrow cotton fabric universally used for making pyejamas or trowsers, especially the large loose garments worn by females. The fabric is also occasionally worn round the waist. It is distinguished by having stripes of a different colour from the groundwork running lengthwise down the piece.

H. H. the Rao of Kutch.

"Mushroo" (3 pieces).
The "Mushroo" is a satin with a cotton back, and belongs to the important class of fabrics consisting of silk and cotton. It is a favourite material, and is used in a variety of ways by the well-to-do classes for dress purposes, covering cushions, &c. All mushroos, especially the finer kinds, wash well, an indispensable property of fabrics used in Hindu clothing.
"Chofal," "Gujeea," "Puchedee," "Boogun," and other fabrics.

Surat Jail.

Large towels (3).

Bengal Committee.

Coarse cloths (7 pieces). From Nuddea, Cachar, Malda, and the Garo Hills.
Towels or dusters (4). From the Bardwan district.
Table-cloths (6), white and coloured. From Patna and Sylhet.
"Purdah." Curtains (2). From Sylhet.
"Mooshoory." Mosquito curtains (2). From Sylhet.
Bedding (2). "Pori." From Sylhet.
Sheets (2). From the Bardwan district.
Counterpanes (2). "Sogani." Malda.
Cotton carpets (2). "Dari" and "Kallum." From Patna.
Cotton rug. "Kuki Parri." From Cachar.
"Sarees." Wrappers (4). Sylhet and the Bardwan district.
The sari is the only garment worn by Hindu females; it is generally in lengths of 5 yards. Half the piece is wrapped round the lower portion of the body, and either fastened to a string or tucked in over the hips, and the remainder covers the upper portion of the body and the head.
"Phenick." Worn by Munipuri women. From Cachar.
This is generally the sole garment of Munipuri women. It is worn with the stripes horizontal; it is fastened round the body over the breasts and under the arms, and falls unbroken almost to the feet.
Cloth worn by Naga girls. Cachar.
Worn by Naga girls in the same manner as the Phenick by Munipuri women.
Cloth worn by Angami Nagas round the loins, ornamented with shells. Cachar.
Kookie woman's petticoat (2). Cachar.
This is worn round the waist, just covering the thighs and lower part of the abdomen.
Angama Nagi and Chiru Kookie cloths (3). Cachar.
"Gando."
A waistband used by the Garo Hill tribes.
Doorapallah and Charkhana (check) chudders. From the Bardwan district.

North-West Provinces Local Committee.

"Pugree." Head-dress for male. Jaloun.
"Saree." Woman's cloth. Black and red. Jaloun.
Counterpane. Mushir and red cloth. Jaloun.

Punjab Committee.

Cotton carpeting, "Darī." Ludhiana district.
Cotton cloth (checked). Ludhiana district.
"Gambroon" fancy cloths, principally in the European style. 7 pieces. Ludhiana district.

Rahún, Jalandhar.

"Ghâti." Cotton fabric (4 pieces).
This is a fine, highly-glazed fabric, which is either plain or else damasked or diapered with the diamond pattern.

Oude Local Committee.

Cloth for quilts and sheets (12 pieces).
Piece of longcloth.
Counterpane.
Turban.
Nynsook chintz (2 pieces).
Country chintz (1 piece).
Wood-cuts. For stamping cloth (5 specimens).

Mysore Local Committee.

Cotton cloths (2). Worn by the lower class of Hindu women.

Turban ("Rummálu"). Cotton, with gold lace border. Worn by the lower class of Hindu women.

Central Jail, Bangalore.

Cloth used in tent-making.
One ("dusúti") for outside, one ("dangari") for middle lining, and one (chintz) dyed and stamped for inside. These are made by convicts with the hand-looms commonly in use.

Indore Local Committee.

Turban and "Saree" (woman's cloth). Made at Indore in the common loom.

"Dhotee." Man's cloth. Made at Maheysir.

Tape. For bedding.
Tapes form a considerable article of native manufacture, being extensively used in the making of bedsteads.

"Dosuti" cloth.
"Dosuti" is a thick cloth, much used for dusters; it is also used for clothing by the poorer population; also for bedding and other general purposes. As its name implies, the thread with which it is woven is double (do-sút).

Sutranjee (large cotton carpet). Made in Indore jail.

Bhopawur Pul Agency.

"Pachori." Cotton cloth wrapped round the shoulders.

"Lungotee." Small "dhotee" or loin cloth.

"Kandora." Woollen cord, which passes round the loins to keep up the "lungotee."

"Pheta." Cotton cloth. A strip that goes round the head.

"Ghagra." Petticoat.

"Ornee." Cotton cloth, wrapped round chest and back.

"Kachlee." Bodice.

India Museum, London.

"Palampores," or bed-covers (32). Cotton and chintz.
Cotton collections, consisting of articles of apparel, as turbans, sarees, dhotees, chaddars, &c., and fabrics for domestic use, such as towels, table-covers, bedding, sheeting cloth, &c., &c. from all parts of India. (From the London Exhibition of 1872.)

Blocks used in calico printing. From Bombay. (From the London Exhibition of 1871.)

Collector of Benares.

Cotton manufactures from Benares and Burdwan. (From the London Exhibition of 1872.)

Farmer and Rogers, London.

Cotton rugs (6).

SECTION III.—LINEN, &c.

This section includes raw fibres, yarns, cordage, and other manufactures therefrom, as well as all manufactures from straw, reeds, cane, and similar substances.

A.—FIBRES.

No description of raw produce is more industriously sought after by manufacturers than vegetable fibres, and India is a field to which they have long and hopefully directed their attention. Undoubtedly the vast resources of our Indian Empire in this branch are as yet but partly known, and there is good ground for believing that a large number of fibrous plants grow with luxuriance, which would yield a material commanding a constant demand in western markets if a large and regular supply could be secured.

Collection of Fibres exhibited by the Superintendent of the Central Jail, Bangalore.

132, 133, 134. Aloe fibre, rope, and mat. Agave vivipara.
135, 136, 137. Pundi fibre, rope, and mat. Hibiscus cannabinus.
138, 139. Lily fibre. Sanseviera zeylanica.
140. Aloe fibre. Agave Americana.
141. Aloe fibre. Agave vivipara.
142, 143. Pundi fibre. Hibiscus cannabinus.
144. Sunn fibre. Crotolaria juncea.
145. Yercum fibre. Calotropis gigantea.
146. Plantain fibre. Musa paradisaica.
147. Screw pine fibre. Pandanus odoratissimus.
148. Cocoanut fibre. Cocos nucifera.
149. Yucca fibre. Yucca gloriosa.
150. Mulberry fibre. Morinda citrifolia.
151. Esculent okro fibre. Abelmoschus esculentus.
152. Súle Marada Náru.
153. Góni Marada Náru.
154. Kaduaralémarada Náru.
155. Bundajibethu Náru.
156. Bélada Náru.
157. Thabasi Náru.
158. Jane Náru.
159. Halasinamarada Náru.
160. Aladamarada Náru.
161. Besarimarada Náru.
162. Gelikémarada Náru.
163. Sannakathe Náru.
164. Sannachellémarada Náru.
165. Mulikémarada Náru.
166. Kurachi Náru.
167. Achela Náru.

COLLECTION of FIBRES exhibited by the Conservator of Forests, Berar.

4,354. Bur. Ficus indica.
4,355. Koombee. Careya arborea.
4,356. Dhamin. Grewia elastica.
4,357. Moholie. Bauhinia vahlii.
4,358. Moyah (a grass).
4,359. Pallas. Butea frondosa.

FIBRES exhibited by the Local Committee of Berar.

832. Sunn. Crotolaria juncea.
833. Ambadee. Hibiscus cannabinus.

FIBRES exhibited, together with drawings of the plants yielding them, by H.H. the First Prince of Travancore.

1,602. Kaiva fibre.
1,603. Sucha fibre.

COLLECTION of FIBRES exhibited by the Forest Department, Central Provinces.

4,323. Bakl Pallas. Butea frondosa.
Fibre of roots from which strong ropes are made.

4,324. Bakl Rinj. Acacia alba.
Prepared from the bark by maceration; used for fishing nets and coarse cordage.

4,325. Bkal Ják Tige. Marsdenia tenacissima.
Prepared from the bark of young shoots; used for bow strings and fishing lines; stronger than hemp.

4,326. Murroor Phallie. Helicteres isora.
Employed in making ropes.

4,327. Murroor Phallie. Eriochlæna candollii.
Coarse ropes are made from this fibre.

4,328. Bakl Dhamin. Grewia elastica.
Strong ropes are made from the fibre which is prepared from the bark.

4,329. Bakl Kumbi. Careya arborea.
Prepared from the bark and made into coarse cordage and gun matches.

4,330. Bakl Mahwal. Bauhinia scandens.
The line made from this fibre equals in strength the best hemp.

4,331. Bakl Arí. Bauhinia racemosa.
Ropes and matchlock matches are prepared from this fibre.

4,332. Bakl Bhindi. Abelmoschus ficulneus.
This fibre is manufactured into string, ropes, gunny bags, and paper.

Amphak. A course fabric made of the bark of a tree from the Garoo Hills, used by the hill tribes as a covering by night. Exhibited by the Bengal Committee.

FIBRES exhibited by C. T. Longley, Esq., of Salem, Madras.

1,609. Acha. Hardwickia binata.
1,610. Mulla Mungee.
1,611. Cut-athee.
1,612. Sambakathalay.

1,613. Neilgherry nettle. Urtica heterophylla. Exhibited by W. G. McIvor, Ootacamund.
Mr. McIvor in forwarding these excellent specimens appends the following remarks:—
The plant grows wild all over the Nilgiris, and as it is well known to the natives, its cultivation might be readily extended. Its cultivation on the hills would pay well as soon as the rail is finished to Coimbatore.
With reference to the preparation of the fibre, that from the bark of the old wood was steeped in cold water for about six days.
The bark of the young wood was steeped in hot water for about twenty-four hours, when the fibre was fonnd to separate readily from the pulp. Neither of the specimens were exposed more than three weeks to bleach, and consequently the colour is not so good as would have been obtained had more time been occupied in the bleaching process.

FIBRES exhibited by the Local Committee, Indore.

893. Flax.
894. Hemp.
895. Hemp string.
896. Tat puttee.

8,217. Serajgunge jute. Exhibited by M. David.

5,658. Flax and hemp, exhibited by H. H. the Rao of Cutch.

COLLECTION of FIBRES exhibited by the Oude Local Committee.

3,635. Moong. Saccharum munja.
Grows wild all over Oude, and is planted in hedges. The moonj or fibre is prepared from the vagina of the leaf just when the stem begins to bear flower; ropes for towing boats on rivers, and twine for bottoms of charpoys (bedsteads), are made from this fibre. If it is not occasionally wetted, and allowed to become too dry, it easily breaks when used. The prepared fibre costs two rupees per maund.

3,636. Ambaree. Hibiscus cannabinus.
Every ryot sows a small quantity along the edges of his usual crops for his own use. It is not, but it might be cultivated extensively all over Oude, and in all kinds of soil. It is sown in the beginning of the rains, and when it commences to flower, it is cut and treated exactly in the same way as 'sunn hemp' from Crotolaria juncea. The proportion of fibre is about half the weight of the plant. It is used for making rope, sackcloth, twine, paper, &c. The cost of the prepared fibre is from three to four rupees per maund, according to its strength, length, and cleanliness.

3,637. Tooria.
3,638. Sunn. Crotolaria juncea.
Cultivated near cities by hundreds of beegahs; but in the vicinity of villages only in small quantities, principally for the purpose of making fishing nets. Its cultivation can be extended all over Oude, and principally where a light soil exists. It is sown very thickly at the beginning of the rains, so that it may grow tall and thin. When it begins to flower, it is cut near the root, tied in large bundles, and immersed in water, putting some weight on it (generally mud) to prevent its being carried away. After remaining immersed from four to eight days it is withdrawn from the water, taken by handfuls, beaten on a piece of wood or stone, and washed till quite clean, and the cuticle with the leaves completely removed from the other portion of the plant,

Each handful is then piled musket fashion, and left to dry. When perfectly dry, the woody portion, which has been more or less broken, is separated from the fibre by farther beating and shaking. From 3 to 6 maunds of fibre are extracted from each beegah of plant. The fibre is used for making rope, sackcloth, nets, twine, and paper. The raw material on the field, as plant, costs from two to four rupees per beegah, according to quality; and the prepared fibre costs from four to ten rupees per maund, according to strength, length, and cleanliness of fibre.

Exhibited by the Conservator of Forests.

4,192. Khus Khus. Anatherum muricatum.
4,193. Bunkuss. Andropogon involutus.
4,194. Moong. Saccharum munja.
4,195-6. Nurkool. Amphidonax bengalensis.

COLLECTION of FIBRES exhibited by the Amritsur Local Committee.

3,005. Euphorbia royleana. Amritsur.
3,006. Hibiscus cannabinus. Amritsur.
3,007. Saccharum sara. Amritsur.
3,008. Musa paradisiaca. Amritsur.
3,009. Anemone obtusiloba. Amritsur.
3,010. Phœnix dactylifera. Amritsur.
3,011. Calotropis procera. Amritsur.
3,012. „ flax. Amritsur.
3,013. Cannabis sativa. Kashmir.

FIBRES exhibited by the Bombay Committee.

5,655. Flax. From Kattyawar.
5,657. Aloe fibre. From Dharwar.
5,656. Sunn fibre, exhibited by Mr. V. Fretwell of Khandeish.

COLLECTION of FIBRES, from the India Museum, London, selected and arranged by Dr. M. C. Cooke.

3,135. Oolut. Abroma augusta.
3,136. Indian mallow. Abutilon indicum.

The plants are gathered and freed of their leaves and twigs, and are put out to dry in the sun for a couple of days. They are then taken up, tied into bundles, and placed under water for about ten days, after which they are taken out, and the fibres are well washed to remove the bark and other foreign matter that may be adhering to them, and are placed in the sun to dry.

3,142. American aloe. Agave americana.
3,143. Great aloe. Agave vivipara.
3,144. Indian aloe. Aloe indica.
3,146. Pine apple. Ananassa sativa.

The leaves are gathered in the same way as the aloe, and are placed on a piece of board and scraped with a blunt knife. The fibres that are loosened are drawn out, the leaves turned over, and from four to six inches of the stem end scraped as before, and as soon as the fibres are loosened by the removal of the pulp in that part of the leaf, the fibres are taken hold of by ths fingers and drawn out. These fibres are again laid on the board, and any remaining portion of the pulp gently scraped out with the aid of water, when they are gathered and dried in the sun.

By another mode of treatment, the leaves are laid in the sun so as to dry up a portion of the sap, when, on being taken up and bruised by the hand, the fibres become loosened, and may be taken hold of, and drawn out. But a great loss of fibre results, so that this method cannot be recommended.

3,146*a*. Khus Khus. Anatherum muricatum.
3,149. Gomuti palm. Arenga saccharifera.
3,157. Rhea (called China grass). Bœhmeria nivea.
3,158. Puya. Bœhmeria puya.
3,161. Palmyra palm. Borassus flabelliformis.
3,165. Mudar. Calotropis gigantea.

Prepared as follows:—

The branches are gathered and dried in the sun for from twenty-four to thirty-six hours, when they are taken up, the bark peeled from the woody parts, and the fibres gathered. If placed out in the dew for a night they lose their greenish tint, and become white.

3,167. Kangra hemp. Cannabis sativa.

It grows spontaneously and in abundance everywhere in the submontane tracts, but is cultivated for the fibre only in the eastern portions of the Kangra, and in the Simla Hills. In 1859 an experimental consignment of two tons of Himalayan hemp was valued in the English market at from 30*l.* to 32*l.* per ton, and during the past year another larger consignment of hemp has been despatched at Government expense, by request of the merchants of Dundee. The price at Lahore is about 15*l.* or 16*l.* per ton.

3,169. Kittul. Caryota urens.
3,173. Cocoa nut fibre. Cocos nucifera.
3,174. Jute. Corchorus capsularis.
3,174*a*. Brown Jute. Corchorus fuscus.
3,275. Jute. Corchorus olitorius.
3,178. Taliera. Corypha taliera.
3,179. Sunn hemp. Crotolaria juncea.
3,181. Jubbulpore hemp. Crotolaria tenuifolia.

The cultivation of "hemp" in the district has received considerable impulse of late. Several years ago, Mr. Williams having occasion to send to Calcutta samples of wax, oil seeds, and other materials, filled up the box with indigenous hemp to prevent breakage of the bottles. On arrival at Calcutta, the cleanness and brightness of the fibre struck the consignee, who had it immediately examined by one of the proprietors of the patent Ropewalks, who pronounced it equal to the best Russian hemp, and at once sent an order for 400 maunds of it. The trade has since gradually increased, and Mr. Williams now sends about 6,000 maunds of this fibre annually to Calcutta. The plant is regularly cultivated, but the cultivation is limited. About 10 per cent. of the fibre is lost in the process of heckling, and the cost varies according to the several places in the district and seasons of the year The price of the prepared fibre is from 3R. 8A.. to 4R. per maund. The present means of inland transport is by country carts to Mizapore, which costs 1R. 8A. per maund, and from thence to Calcutta, by boats, at a farther cost of 1R. 4A. to 1R. 8A., which, with other contingencies, such as covering for carts, or guards' hire, duty in native states, and agency charges at Mirzapore, brings up the cost of the material to 7 rupees per maund before it reaches Calcutta. Mirzapore is, at present, the nearest place of export. The great length of time in getting down bulky produce from Central India, and the enormous expense of transport, have hitherto prevented

Mr. Williams sending his hemp to England; but all this will be overcome the moment the railway line from Bombay to Jubbulpore opens, when the hemp can be landed at Liverpool in as many days as it now takes weeks by country carts and native boats to convey it from the station to Calcutta, and there is no doubt that in a very few years hemp, and also flax, will become large articles of export from the Saugor and Nerbudda territories.

3,183, Mat grass. Cyperus textilis.

3,184*b*. Nepal paper bark. Daphne cannabina.

3,190*a*. Bunkuss. Eriophorum comosum.

3,196. Great aloe. Fourcroya gigantea.

The leaves, cut close to the stem, are placed on a piece of board, and beaten with a short stout stick. After being thus bruised, the pulpy portions are scraped out with a blunt knife, and the fibres subsequently washed in clean water and dried in the sun.

3,196*a*. Neilgherry nettle. Girardinia heterophylla.

3,204. Hemp. Hibiscus cannabinus.

This plant furnishes a portion of the so-called "brown hemp," exported from Bombay. It is readily cultivated, and with more attention to its preparation is calculated to compete with jute.

3,210. Roselle. Hibiscus sabdariffa.

3,218. Sack tree bark. Lepurandra saccidora.

3,220. Flax. Linum usitatissimum.

Flax is mentioned by Strabo as one of the staples of this part of India. A small quantity of Riga seeds, which had been imported experimentally by Dr. Jameson, superintendent of the Government botanical gardens at Saharunpore was distributed amongst the peasents, with instructions as to the mode of cultivation; an agent of great practical experience was deputed to examine and report upon the qualifications of different districts for the growth of flax, and a staff of natives were trained by him to act as scutchers.

In 1856, two tons of flax produced under his superintendence in the district of Goojranwalla were sent to England, and were sold for 92*l*. 2*s*. 2*d*., realising a net profit of 47 per cent.

In 1857, 8 cwt. of flax, grown at Juddura, a tract of country in the Kangra district, bordering on the river Beas, were sent home, and were valued at from 55*l*. to 60*l*. a ton.

In consequence of the success of these experiments, an association, called the "Indian Flax Company," sent out an agent to buy up flax produce. He made the district of Sealkote his head-quarters, and as far as could be judged, had every prospect of ultimate success, but for reasons which it is unnecessary to enumerate here, the enterprise proved a failure.

3,226. Plantain. Musa paradisiaca.

These fibres were prepared from the inner footstalks of the plantain tree. These were taken of certain length, placed on a piece of board, and the pulpy mass scraped out with a blunt knife. Both sides of the stalks having been thus scraped whilst clean water was poured on to wash away the remains of the pulp, the fibres were dried in the sun.

3,228. Manilla hemp. Musa textilis.

3,232. Bedolee. Pœderia fœtida.

3,233. Screw pine. Pandanus odoratissimus.

3,238. Madar-patee. Phrynium dichotomum.

3,240. Moong. Saccharum munja.

This grass supplies a strong good fibre, which is beginning to attract attention in this country, and is now being exported from Kurachi in Sinde.

3,242. Marool. Sanseviera cylindrica.

3,243. Marool. Sanseviera zeylanica.

This plant is both indigenous and common in the province, growing alike in low, marshy, shady spots along the coast, as in Balasore, on high gravelly grounds in the interior, and in the jungle in the tributary Mehals. The fibre it yields in this district is only used for the manufacture of bowstring.

The sample of rope (see Class XIX.) was made for the Local Committee by Captain Bond of Balasore; the leaves are to be had for the collecting. They are, when matured, about two feet long, and each leaf yields from 30 to 40 threads. The same tedious process of detaching the thread from the cellular tissue is employed with this as with the Agave leaf, and it would be necessary to introduce a mechanical method of doing so, ere the production could be made profitable on a large scale. The bowstring and sample of fibre were prepared to order in Cuttack. Not being a marketable article, no attempt at a specification of price can be made.

3,244. Dunchee. Sesbania aculeata.

3,250. Sufed Bariala. Sida rhomboidea.

This fibre is very similar to jute in appearance, but it is considered to be intrinsically so superior that it is worth from 5*l*. to 6*l*. more per ton, and it has accordingly been placed next to that fibre, in order to attract to it the attention which it deserves.

3,259. Bun-okra. Urena lobata.

This plant is the pest of Rangoon and its neighbourhood, springing up spontaneously wherever the jungle is cleaned, and rapidly forming a dense mass of luxuriant vegetation.

The specimen of fibre exhibited has been manufactured in the jail by simple maceration, and afterwards beating the stalks. Very good "gunny" has been made from it, and it is believed that this fibre might, if treated with due care and skill, prove valuable.

Any quantities of the plant may be had for the mere trouble of gathering it.

3,265. Adam's needle. Yucca gloriosa.

B.—YARNS, TWINE, CORDAGE, &c.

Aloe fibre rope from Dharwar. Bombay Committee.

Hemp twine. Exhibited by Indore Local Committee.

Twine made from Moong (Saccharum munja). Exhibited by Oude Local Committee.

String called "saranaj," or "sarmanji dari," from Ramjivanpur, a police outpost in the Gurbetta subdivision, Midnapore district. Exhibited by the Bengal Committee.

Made from a reed called "sar" (Saccharum munja), from which pens are also made. This string is much used in building the better sort of native huts. Finer qualities are sometimes made.

C.—FABRICS OF FLAX, HEMP, JUTE.

This subdivision was represented in the present collection from India by one exhibit only, although many articles are produced which would find a place here, such as gunny bagging and mats, finer manufactures from jute, mats made from Aloe fibre in the North-Western jails, and all manufactures from flax, hemp, rheea, pine apple fibre, &c., and their substitutes.

N.W. Provinces, Local Committee.

Rug of Mudar floss, from the district jail of Ghazeepore.

D.—MANUFACTURES FROM STRAW, REED, CANE, BASS, PALM LEAVES, &c.

Madras Committee.

Collection of Kimidy basket-work, as follows :—

Work-baskets (32), fancy, large, shallow, oval, round &c.; with and without covers. Kimidy, Ganjam.

A nest of 12 baskets in one.

Cigar cases (3).

Table mats, black (12), black and white (12), and red and white (12).

Large floor mat.

H.M. Winterbotham, Calicut.

Palghaut mats (23). From Palghaut.

Bombay Committee.

Circular mats (14), various sizes, coloured. Aden.

Mat baskets (5). Without covers; white and coloured. From Aden.

"Karndas" or basket with covers (6). Black and coloured. Superior quality. Aden.

Mat dishes (4). Coloured; superior work. Aden.

Covers (2). Coloured; superior work. Aden.

Mat water goglet, with cover. Coloured; superior work, from Aden.

Fans (2). Coloured. Superior work. Aden.

"Suprees" (2). White. Aden.

Trays (4), and covered boxes (4). Various shapes and sizes. Coloured. Superior work. Aden.

H.H. the Guickwar of Baroda.

Baskets (3). Various.

Bengal Committee.

Common hand punkahs or fans (2). From Sylhet.

Each fan consists of a single dried palm leaf.

Fancy straw mat fans (2). From Gowalpara.

Straw mats. From 24 Pergunnahs.

A Machlandi mat.

A very fine kind of mat made in the Tumlook subdivision, Midnapore district.

Bengal Committee.

A "Saji" or flower-basket of bamboo. From Gurbetta, Midnapore district.

Made by "Domes." Used for offerings of flowers made to idols.

Indore Local Committee.

"Tatputtee." Made at the village of Raoo near Indore.

This is a coarse matting made in narrow pieces from string of "Sunn" fibre (Crotalaria juncea). It is much used for packing purposes, and for coarse flooring. It is made at every jail, and is common all over the country.

India Museum, London.

Mats (24), of which the largest measures 15 ft. 2 in. by 3 ft.

Hon. R. Bourke, M.P.

Bark chair bottoms (2).

SECTION IV.—SILK FABRICS.

A.—SILK AND SILK THREADS, SPUN SILK, &c.

Bengal Committee.

7,953–7,955. Silk thread from cocoons of "Arindi" moth (Attacus ricini). From Dinagepore, Bogra, and Rungpore.

The sample from Dinagepore is not manufactured as an article of commerce. The silk from which it is made is cultivated by Mussulman ryots in small quantities near their houses. The cocoons are heated in a pulp, and the thread is wound or twisted off by hand.

8,050. Silk thread. From Pat, Moonga, and Eri cocoons, 6 specimens, fine and course. Nowgong, Upper Assam.

104. Eri raw silk (course) with spindle. Nowgong, Upper Assam.

8,057. Silk thread from Malda, 5 tolas (about 2 oz.).

7,956–7,959. Silk thread from tusser cocoons (Antheræa paphia). From Beerbhoom, Bhagulpore, Midnapore, Khurdah (in Orissia), Baryadgunge (Gya district), Nya Doomka (Sonthal Pergunnahs).

7,960. Silk thread (dyed), from tusser cocoons (Antheræa paphia) from Khurdah in Orissa. Dyed with lac and gundli (Rottlera tinctoria).

7,963. Silk thread ("Munga"). Seebsaugor, Assam. From cocoons of Antheræa assama.

7,964. Silk thread ("Mezankori"). Seebsaugor, Assam.

So called from the name of the tree, on the leaves of which the worms are fed.

7,965. Silk thread ("Pat," Bombyx textor). Seebsaugor, Assam.

The worm which yields this silk is generally identified with B. mori; but this is declared to be an error.

7,966. Silk thread. From ordinary Chinese moth, contributed by Lal Behari Dutt, Goolda Factory, Midnapore.

Bombyx silk; two qualities, "ordinary" and "extra." The ordinary quality only is reeled, as the "extra" does not pay. The filature produces about 300 factory maunds annually.

7,967. Silk thread. From Rajshahye.

Also a Bombyx silk. The yield in Rajshahye is about 5,000 maunds, and supports about 250,000 people.

7,968. Silk thread. Prankissen, Law, and Co.

Produced at Moheshpore, near Ghatal, in the district of Midnapore. The annual out-turn is about 300 lbs.

7,971. Silk thread. Messrs. L. Payen and Co. of Bholahat, district Maldah. Reeled by steam power.

7,972. Silk thread. From Bholahat, Maldah. Native silk reeled in the village of Bholahat.

7,969–7,970. Silk thread. From Midnapore and Berhampore.

These specimens (Nos. 7,966 and 7,970 are all the produce of Bombyx cocoons commonly said to be B. mori; but this is not so. B. textor, B. fortunatus, B. crasi, and B. sinensis being the species to which the Bengal cocoons should be referred.

8,021. Waste or refuse silk of Bombyx mori.
8,022. Tangle from rejected cocoons ("lat") of Bombyx mori.
8,023. Thread from ditto.
} From Bogra.

8,024. Bundle of "chessum" (refuse silk after reeling) contributed by Messrs. L. Payen and Co., Bholahat, Maldah.

Native name "jhattam;" the produce of Messrs. L. Payen and Co's. steam filature. This refuse, formerly turned to no use whatever, is now an important article of merchandise, its export to England having reached an average of 14,000 maunds per annum.

7,973. "Chessum" (refuse silk after reeling) of Bombyx mori. From Bogra.

7,974–7,976. "Chessum" from cocoons of the varieties of tusser moth, known as "Ampathi" or "Ampatia Fuki," "Dava," and "Baghai." From Purulia, Maunbhoom.

Punjab Committee.

Raw silk (five varieties). Muttra.
Silk thread (5 skeins), coloured. Peshawur.

Mysore Local Committee.

Silk (five specimens) from Japan worms reared in the Central Jail, Bangalore.

India Museum, London.
(Specially selected by Mr. F. Moore.)

Raw silk. *Bombyx fortunatus*, Hutton. "Dasee." Beng. Anna filature, 1866. Bengal.
Dasee silk. *Bombyx fortunatus*, Hutton. Surdah filature, 1866. Bengal.
Raw silk (white). *Bombyx sinensis*, Hutton. Small Chinese monthly silkworm of Bengal. "Cheena," Seena, or Sina. B. Berhampore filature. Bengal.
Raw silk (yellow). *Bombyx mori*, Linn. Cashmere silkworm. Umritsur, Punjab.
Raw silk (yellow). *Bombyx mori*, Linn. Cashmere silkworm. Seetapore, Oudh.
Raw silk (yellow). *Bombyx mori*, Linn. Cashmere silkworm. Bogra.
Raw silk (white). *Bombyx mori*, Linn. Gowhatty, Assam.
Raw silk (yellow). *Bombyx arracanensis*, Hutton. Arracan silkworm. Burmah.
Raw silk. *Bombyx textor*, Hutton. "Boro-pooloo." Beng. Mysore.
Raw silk. Mysore.
Raw silk (cocoons). Tinnevelley.
Tusser silkworm cocoons. *Antheræa paphia*, Linn. "Tusser," Tussur, Tusseh, Tussah. Beng. Kolisurra. Mahr. Cuttack, Bengal.
Tusser silk. Bhangulpore.
Tusser silk. Gyah.
Mezankoorie silk. *Antheræa assama* (variety). Assam.
Mezankoorie silk and cocoons. Assam.
Moonga silk. *Antheræa assama*, Helfer. "Mooga," "Moonga." Assamese. Kamroop, Assam.

Eria silk thread. *Attacus ricini*, Jones. "Arrundi," Arrindy-arria. H. Eri, Eria, Erindy. B. Assam.
Eria silk thread. Durrung, Assam.
Eria silk and cocoons. Rungpore.

Bengal Committee.

7,977-7,979. Sample pieces of coarse silk cloth from Erindi cocoons. From Dinagepore, Bogra, and Rungpore.

That from Dinagepore is strong, warm, and very durable. Its colour, a dull drab, conveniently conceals the dirt and soilure to which it is exposed by those who chiefly wear it.

8,034. Silk cloth (sample piece). Chittagong.
7,980-7,988. Tusser silk cloths. From Beerbhoom, Behar (Patna district), Bhagulpore, Midnapore, Khurdah in Orissa (2 specimens, dyed), Baryagunge (Gya district), and Munguldai (2 specimens).
8,012-8,014. Tusser silk cloths contributed by Saroda Persad Guiri of Musbul, in Cutwa, Burdwan district; Iswar Das Kaiburt, of ditto, and Bepin Chandra Rakhit.
7,989-7,991. Silk cloth made from Moonga, Mezankori, and Pat cocoons, from Seebsaugor, Upper Assam.
8,046-8,049. Tusser silk cloth. Plain and flowered ("Kutli," *i.e.*, diapered); Tusser and cotton "Kutli;" Tussser and cotton chequered cloth. Gopinathpore, Bancoorah.

This cloth is 2¼ yards broad. It is used for Chaddars. "Kutli" or flowered, *i.e.*, diapered cloth sent is grey. The dye is said to be a fast colour.

8,028-8,030. Tusser silk fabrics called respectively "Ampathi," "Dava," and "Baghai." From Purulia, Maunbhoom.

"Ampathi" signifies "like the mango leaf;" "Dava," *i.e.*, "white," a contraction of Dhavala; "Bagha" means "striped like the skin of a tiger" (Bagha).

7,996-8,002. Silk fabrics (7 samples), bearing the names of "Canary Bandana," "Red Bandana," "Chocolate Bandana," "Chopa," and "Momi." From Cossimbazar, Moorshedabad.

Cossimbazar has for 200 years been known for its silk, and is the place in Bengal of which the earliest mention occurs in English records as being a silk-producing locality.

Bengal Committee.

109. Cartridge cloth, "Amiantine" (sample piece). From Midnapore Jail.

Made in the Midnapore Jail from the refuse silk left from the Tusser cocoons. This cloth has also been manufactured experimentally in the Rajshahye Jail.

8,003, 8,004. Silk fabrics, called "Corah" and "Baluchur Sari." From Berhampore, Moorshedabad.
8,005-8,019. Silk fabrics (12 specimens) from Jehanabad, Burdwan district, bearing the names of "Chandtara," "Suti Phulam," "Panchpat," "Narunsi," "Phulal," "Nala," "Jhilimili," "Mushfa," "Lalmotra," "Ojamuti," and "Poshakijabda."

The names given to different silk fabrics are very numerous and sometimes of extremely fanciful meaning. Most of them refer to qualities or appearances in the cloths by poetical epithets, occasionally very happy and appropriate; but sometimes it is difficult to understand why a particular name is given, as it does not always seem to indicate any distinctive quality to which a comparison to bird or flower or moon and stars could well be made, but rather to be the result of mere fanciful caprice. This, however, is not generally the case; as a rule the epithets seem well chosen, as the following will show:—

Chandtara, "moon and stars," *i.e.*, of a spotted or powdered pattern.
Suti phulam, "flower-threaded."
Panchpat, "five-leaved."
Narunsi, as fine as the edge of a nail cutter ("narun").
Phulal, "flower-like."
Jhilimili, "barred" or gauze like.

8,035-8,044. Silk fabrics (11 specimens), bearing the names of "Shiraza" (of Shiraz), "Sabz-Shiraza" (green silk of Shiraz), "Dhupchhaya. From *dhup* sunshine, and *chhaya*, shadow. The native name for "shot silk," *i.e.*, a fabric in which the warp and the woof are of different colours, "Kora" (raw, unbleached), &c. &c. From the Maldah district.
7,986. Silk kummerbund, striped and flowered. Bancoorah.

The kummerbund, literally waistband, or sash, is used chiefly by the Mahomedans; the manner in which the dhotee is worn by the Hindus rendering it less necessary in their case. Both Hindus and Mahomedans, of the richer classes, however, when in full dress almost invariably wear it.

7,993, 7,994. A phata or kummerbund, and a China coat. From Sarun, presented by Shew Golam Shaw, Rai Bahadur.

This dress is called a "China coat," not because it is made of China silk, but because its shape is said to be of Chinese derivation. Coats of this cut are called China coats, whatever their material may be. They are in common use in Bengal, both among Hindus and Mahomedans.

7,992. A silk saree, of ornamental pattern. Calcutta Bazaar.
8,020. Dhotee of tusser silk (loin cloth). Contributed by Adel Chandri of Baghkra.
8,024, 8025. Dhotee (loin cloth), and handkerchief of native silk (Bombyx mori). From Bogra.

N.W. Provinces Local Committee.

Silk pieces (4). White, mauve, red, and ash-colour. Benares.
"Kummerbund." Waistband or sash. Benares.
"Lahanga." Skirt or petticoat. Benares.
"Gulbadan." Striped silk. 7 pieces. Azimgurh.
Silk rugs (2). Black and crimson. Benares.
Purse. Crimson silk. Benares.
Curtain cloth (2 pieces). Presented by District Jail of Ghazeepore.

Punjab Committee.

Coloured silk (3 pieces). "Alacha." Woven in Bokhara. From the Peshawur district.

"Alacha" is much used for making pyjamas (trowsers).

Silk piece. "Kanawez." Shaded purple and green. Peshawur district.
"Kanawez" is the native name for plain shot silk.
Silk pieces (4). Striped and checked. From Lahore.
"Loongees," shoulder cloths (8). From Multan.
Silk pieces (2). For turbans. Five yards each. Multan.

Dr. Leitner, Lahore.

Silk fabrics, handkerchiefs, and scarfs from Bokhara, Khotan, and Yarkand.
The manufacture of silk is the occupation of every Turki household from China to the Sea of Marmora, near where (at Brussa) the best silk is still produced. Bokhara silkworms are much prized, but have not yet succeeded in the Panjab or Asia Minor. (Attempts are now made in Kashmir to domiciliate the silkworm.) The Japanese worm, which is of an inferior kind, seems to get acclimatized in Asia Minor, and should be tried in the Panjab and Cashmere.
These fabrics are interesting as indicating the taste of the Central Asiatics as regards the price they are willing to pay and the patterns which they affect, and which might be looked at in connexion with Wereschgin's striking Central Asian pictures at the Crystal Palace (Dr. Leitner).

Chamba Mal, Amritsar.

"Galbadan." Striped silk (1 piece).

Madras Committee.

Gown pieces (3), Salayada, Maganarnam, and Kutiny. From Tanjore, obtained by M. R. Ry. A Streenevasa Row.
Silk carpet. From Tanjore, obtained by M. R. Ry. A. Streenevasa Row.
Silk thread (4 samples). Kistna district.
Silk pieces (2). White and red. Kistna district.
"Zamaivar." Silk cloth (1 piece). Tanjore.
Silk turban cloth with gold fringe. Coimbatore.
Silk "sarees" (2). Female dress. Madura and Tanjore.
Silk "cholees" (3). From Tangore.
The "cholee," or bodice, is a closely-fitting jacket with sleeves, either covering the breast only or having a back attached to it as well.
Silk handkerchief. Coimbatore.

Mysore Local Committee.

"Sarees" (30). Hindu female attire.
These fabrics consist of silk, or a mixture of silk cotton, and are either plain or adorned with gold lace, stripes, &c.
"Kuppasas" (4). Used by Hindu women for bodices.
"Kummerbunds" (3). Waistcloth worn by men.

Vincent, Robinson, & Co., London.

A silk rug. 7 ft. 2 in. × 3 ft. 10 in.

SECTION V.—EMBROIDERIES; GOLD AND SILVER WEBS; LACE AND LOOSE WOVEN FABRICS; FRINGE WORK, &c. &c.

Madras Committee.

Turbans (2). Gold embroidered. Madras.
Children's caps (2). Gold embroidered. Madras.
Net dress. Embroidered. Madras.
Muslin dress. Embroidered with beetle wings. Madras.
Muslin (embroidered with gold). 2 pieces, Madras.
Saddle cloth. Velvet embroidered with gold. Madras.
"Musnud" (gold embroidered). Consisting of a "Tursh" (carpet), one large and two small. "Tukiyas" (pillows). Madras.

Ediyengudi Mission School, Madras.

Lace (8 specimens).
A "Bertha." Black and gold lace.

Bombay Committee.

"Kinkhaub." Gold and silver brocade. (10 pieces). From Surat and Ahmedabad.
"Hemroo" (single and double), 3 pieces. Surat.
"Luppa" (6 pieces). Ahmedabad.
"Kinkob," "Hemroo," "Luppa," are all of the same order of manufacture, gold, or gold and silver and silk. In the "Kinkob," metal predominates, whereas in the "Hemroo," the silk predominates. Another of the latter's characteristics is that the design is generally a diaper or "Boota." Affixes of "single" and "double" are also made use of to designate one colour or several, such as Ekowdu Hemroo and Bewdu Hemroo. In Surat it is known as "Kumjurno Aleeacha," which means that there is only a small quantity of gold thread used in it. "Luppa" is all gold or silver, that is, the metal only is visible.
"Kinaree" (18 pieces). From Ahmedabad and Kattyawar. Gold, silver, and silk edging for *sarees, cholees, &c.*
Silk and gold cloth. From Surat.
Silk pieces (7). "Gaut." From Kattyawar.
Silk piece, rich Paythani green. Fron Yeola.
"Oopermee," Head dress. Red silk with gold border. Kattyawar.
Caps (2). Velvet embroidered with gold and silver. Bombay.
Veils (2). Silk. From Aden.
Sarees (3). Women's dress. Of silk, and silk and cotton with gold border. From Bombay, Yeola, and Surat.
"Shaloo." Woman's garment. Green silk with gold border. From Kattyawar.
"Mushroos" (2). Used as a Ghagra. Ahmedabad.
The Ghagra is a skirt worn by women from Malwa, Guzerat, Kattyawar, and Kutch; also by Purbhoo girls in Bombay, fastened by a band round the waist and reaching the ankles. The Ghagra and Cholee are comparatively modern innovations, adopted by Hindoo and Jain women from the Mahomedans. In the south of India it is the popular belief that women were made to bare their breasts to win back the

male population from malpractices, but it is a fact that till the Conquest of India by the followers of the Prophet "made up" apparel was known.

"Ghagra." Silk petticoat. From Kattyawar.
Khund, Cholees (12). Bodice worn by native women. From Poona, Dharwar, and Kattyawar.
"Pitambars" (4). Soft silk Dhotees used as skirts, and body covers. Bombay and Yeola.
"Paejamas." Trowsers. Striped silk. Aden.
Allaeecha (2 pieces). Gharub silk, half cotton. From Surat.
"Kutchia." Silk with gold and silver border. Worn chiefly by athletes. From Nassick.
Coat (child's). Red, with silk embroidery. Surat.
Tablecloth. Embroidered, with gold borders. Ahmedabad.
"Torun." Drapery for hanging over the threshold. From Kattyawar.
"Chaklas" (2). Samplers. From Kattyawar.
Gold lace (3 specimens). Surat.
Gold and silk lace (5 specimens). Surat.
Gold and silk cord (4 specimens). Aden.
Gold and silver lace. Surat.
Silver lace (4 specimens). Surat.
Silver and silk lace (6 specimens). Surat.
Silver cord. Aden.
Silver and silk cord (2 specimens). Aden.
Lace for "Paejamas" or trowsers. Aden.

H.H. the Rao of Kutch.

Tablecloths (3). Silk embroidered. Kutch.
Cushion covers (6). Embroidered. Kutch.

H.H. the Guickwar of Baroda.

Native saddle, complete. Baroda.

H.H. the Thakoor of Bhownugger.

Native saddle, complete. Bhownugger.

Babu Sridhur Sai, Zemindar of Maujha, in Sarun.

"Purtalla." Gold worked. A waist and shoulder belt combined.

N.W. Provinces Local Committee.

"Kinkhaub" (8 specimens). Gold and silver brocade. From Benares.
Ladies dress. White and silver. Benares.
Shawl. White and gold. Benares.
Purse. Blue and silver. Benares.
Gold fringe (2 specimens). Benares.
Rug. Green velvet and gold. Benares.
Doputtah (sheet). Embroidered with gold. By Kulloo Ghazee of Boolundshuhur.
"Rampore Khise." Sheets, gold embroidered (2). From Rohilcund.

Baboo Balgobund Khuttree, Benares.

Kinkhaub (5 specimens). Gold brocade. By Ruhman Jolaha, of Benares.

Baboo Dabee Pershad, Benares.

Kinkhaub (4 specimens). By Wahid Mian Joleaha.
Dress. Black and gold. By Walli Najar.
Shawl and scarves (2). Black and gold. By Golam Kadir.
Rugs (4). Embroidered with gold and silver. By Ameer Khan.
Purse. Green and gold. By Ameer Khan.
Gold fringe. By Abdullah.

Punjab Committee.

Pagris (4). Turbans, made at Peshawur, with gold edging, from Russia.
Caps (3), for wearing with the above. Scarlet and gold. Peshawur district.
Caps, woman's (2). Gold embroidered. Peshawur district.
Caps (2). Embroidered with gold. By Lala Rormi Mal.
Scull-cap. Merino, embroidered with silk. Ludhiana district.
Head-dress. "Paranda." From Lahore.

The "Paranda" consists of a long band or cluster of silk threads, finished off at either end with tassels, ornamented with gold thread, beads, &c.

This is plaited into the long plaits or tails worn by native women, and especially by girls.

Scarves (3). "Lúngis." Embroidered with gold. From the Ludhiana district.
Shawls (6). Merino and net, embroidered with gold and floss silk. By Pahlad Das, Delhi.
Shawl. Net embroidered with gold. By Lala Rormi Mal of Delhi.
Jacket and Burnouse. Merino, gold embroidered. By Moti Ram, Delhi.
Girdles (3). Izar-bands. From Lahore.

The Izar-band is a long netted silk sash, ending in two tassels more or less ornamented; it is used to fasten the paijamas or loose trowsers round the waist.

Shoes and slippers (6 pairs). Embroidered with gold and silk. From the Peshawur and Ludhiana districts.
Slippers (5 pairs). Embroidered with gold. By Seraj Uddin and Sharaf Uddin of Delhi.
Table cloths (3). Embroidered with curious figures in silk. From Cashmere.
Table cloth. Merino, embroidered with coloured silk. By Nanak Chand, of Delhi.
Table cloth. Broadcloth embroidered with gold. By Lala Rormi Mal.
Chair cushions (3). Embroidered. By Moti Ram, of Delhi.

Lahore Museum.

Table cloth. Scarlet, embroidered with gold and silver scales ("Maikaish tari"), gold and silver braid (kala batun) and beetle's wings (sabz par).

Made under the direction of the curator of the museum; hence the best of its kind, both in material and finish.

Dr. Leitner, Lahore.

A pair of Hindustani tinsel slippers.
Seven caps (embroidered in gold and silver tinsel) for boys. Made in the Punjab.
Dress of gold thread (Jamdani) for a boy, with a cape to match.
Dress of the same kind for a girl.
A Kemkhab cloak (purple and gold).
Two embroidered table covers from Sind.
Two embroidered cushions from Sind.
An embroidered smoking cap from Sind.
An embroidered pair of slippers.
An embroidered tea-pot cover.
Two embroidered lamp stands.

These articles need no description, as there are other specimens of the same kind in the Indian section.

Ahmad Shah and Ahsan Shah, Ludhiana.

Rampur Chaddars (15). Embroidered and fringed. A kind of square shawl, made from the "Pushm" or hair of a species of goat found north of Cashmere.

Burnouse. Embroidered. Ludhiana.

Devi Sahai and Chamba Mal, Amritsar.

Rampore Chaddars (5). With needle-worked border.

"Choghas" (9). Gentlemen's dressing gowns. Embroidered.

Lady's dressing-gown. Embroidered.

Nanak Chand, Delhi.

Shawl and cloak. White merino, embroidered with gold.

Table-cloth. White merino, embroidered with coloured silk.

Oude Local Committee.

Chikan-work (5 pieces). Figured or embroidered muslin.

Caps (6). Embroidered.

Scarves (5). Embroidered.

Dopatta. Embroidered. A woman's scarf or veil.

Shawl and jacket. Embroidered.

Shoes (7 pairs). Embroidered.

Hookah cloth. Embroidered.

Bhopawur Pul Agency

Sarposh." An embroidered table cover.

Government of Bombay.

Caps (8). Embroidered with gold, silver and silk. By Kurrumchund Moorjmull and Chuttoomull Moorjmull, Haidarabad, Sind.

Kinkhab "topee." Skull cap made of gold and silver brocade (Kinkhab). By Moolo Singhun, of Haidarabad, Sind.

"Pairan" (under-shirt). Mulmul applique work. By Moteram Ramchund, Haidarabad, Sind.

Pair of "Sootheen" (long loose trowsers worn by women). Embroidered with silk. By Moteram Ramchund, of Haidarabad, Sind.

Slippers (13 pairs). Embroidered with gold and silver. By Kurrumchund Moorjmull and Chuttoomull Moorjmull, Haidarabad, Sind.

Doylys (7 pairs). Silk, embroidered. By Kurrumchund Moorjmull and Chuttoomull Moorjmull, Haidarabad, Sind.

Cushion covers and cosy covers (16 pairs). Embroidered with gold, silver, and silk, by Messrs. Kurrumchund Moorjmull and Chuttoomull Moorjmull, and Moolchund Mengraj, of Haidarabad, Sind.

Table-cloths (4). Embroidered with gold, silver, and silk. By Messrs. Kurrumchund Moorjmull and Chuttoomull Moorjmull, of Haidarabad, Sind

India Museum, London.

Turban pieces (4). Muslin, worked with gold. From Ahmednuggur, Madras, and the Deccan.

Scarves, waist-cloths, and other articles of apparel (21), of silk, muslin, and cotton variously ornamented with gold. From Madras, Mysore, Bombay, the Deccan, Sind, Central Provinces, and other parts of India.

Floor cover. Embroidered with silk, 21 ft. × 11 ft. 6 in. From Cashmere.

Carpet. Velvet embroiderrd with gold and silver, 10 ft. 9 in. × 10 ft. 8 in. From Hyderabad, the Deccan.

Carpets (2). Embroidered velvet. From Benares and Madras.

Awnings (2). "Shameanah." Velvet, embroidered and fringed with gold and silver. From Benares and Moorshedabad.

Saddle-cloths (2). Velvet, embroidered with gold, and gold and silver brocade. From Benares.

Cashmere quilt. Embroidered with silk. Cashmere.

"Doprettos" (3). Scarves worn by women. Embroidered with gold and silver. From the N.W. Provinces. (From the London Exhibition of 1872.)

Honourable R. Bourke.

Caps (2). Embroidered with gold.

Cashmere dressing gown. Embroidered.

Dressing gown. Silk, thickly embroidered with gold.

White cashmere skirts. Embroidered with gold.

Cashmere scarves (5). Embroidered with gold.

Muslin scarves (3). Gold embroidered.

Cashmere quilts (2). Wadded and embroidered.

Saddle and saddle cover. Green velvet embroidered with gold; silver stirrups.

Horse covers (5). Silk, muslin, and cloth, embroidered with gold and silver.

Ornamental dog cart.

Sheath for knife. Velvet and gold.

Embroidered silk (4 specimens), and chains (2) of embroidered cloth.

Farmer and Rogers, London.

Caps (40). Embroidered with silk and gold.

Embroidered scarves (50).

Shawls (4). Gold embroidered.

Embroidered slippers (41 pairs).

Table covers (2).

Embroidered Doyleys (500).

Gold embroidered Doyleys (2 pairs).

Cushions (6 pairs). Gold embroidered.

Book covers (2). Embroidered.

"Cozies" (2). Embroidered.

Punjab Committee.

"Sej band." Multan.

The sej band is a long cord and tassel used to tie down the coverlet of a native bed to the bed posts; only used by people of rank and wealth.

Bengal Committee.

Silk "izarband," or girdle, with pendant ornaments. From Behar Town, Behar, Palna District.

SECTION VI.—LINEN, ARTICLES OF CLOTHING, FUR, HATS AND BONNETS, GLOVES.

Madras Committee.

Slippers (1 pair). Used by Mahomedan ladies. Madras.

Bombay Committee.

Collection of turbans and caps (50). From Bombay.

The turban, or "pagri," is in almost universal use throughout India. It is the only article of dress which indicates the caste and race of the wearer, and there are numerous varieties, which take special names from their size and shape, and the materials of which they are made. Many castes and races have a peculiar head dress. The Konkani Brahmin has on his head a disc of artfully folded red calico, three or four feet in diameter; the Bhatia has the tip of his turban curled up above his forehead, like a rhinoceros horn; the Sikh has a closely fitting and neatly folded turban; the fisherman's turban is usually made out of a piece of old fishing net; and a Mahratta's head dress looks like a bundle of tightly twisted snakes. Of the materials employed in the manufacture of turbans, cotton naturally occupies the first place, as being the cheapest and most abundant. It also has the merit of being a good non-conductor and of permitting at the same time the free escape of perspiration. Silk and wool are also used to some extent, the former by the higher classes. Of the colours employed, white takes by far the most prominent position; red comes next, then yellow, green, blue, purple, and occasionally even black; the darker colours being almost invariably relieved by embroidery. Particular colours are sometimes used on special occasions. Turbans of a snuff colour are worn only by Borees before marriage. A turban of a brown colour is worn in the Mofusil on the occasion of marriage, but in Bombay only during the first year after the death of either parent.

The turban in its unfolded condition ordinarily consists of a strip of cloth varying in breadth from 9 to 12 inches, and in length from 15 to 25 yards.

In some cases, however, the breadth extends to 36 inches, while the length occasionally reaches to 60 yards.

Collection of shoes and sandals (108 pairs) from Surat, Bombay, Kattyawar, Aden, and Kutch. (Contributed in part by Messrs. Ahmedbeen Mahomed, Haji Gama, Girdhur Lalla, and Merjajee.)

Another illustration of the great number and diversity of the tribes found in India is afforded by the curious variety of shoes worn. Thus we have shoes suited for the snows and mountain paths of the Himalaya; broad strong shoes for the frontier warlike tribe; wooden "powdees" worn by the Hindus of Surat when entering into their temples to worship (worn also by Mahomedans); coarse sandals of wood and leather used by native cultivators and labourers; delicate little shoes of silk and velvet embroidered with gold, worn by native ladies; and lastly, the imported patent leather boot, now esteemed by the smarter class of office baboos.

Mat caps and cotton head cloth. Worn by people of Aden and the neighbouring countries.

Embroidered hood or mask, and embroidered cloth (4 pieces). Worn by the women of Aden and surrounding countries.

Waistcoat richly embroidered. From Poona.

"Butwas" (3). Woollen bags in which the natives keep their betel-nuts and betel-pepper leaves. From Poona.

H.H. the Guickwar of Baroda.

Hat, coat, and trowsers. Richly embroidered.

Shoes (8 pairs). Embroidered with gold, silver, and silk.

Bengal Committee.

Caps (2). "Topi." From Sylhet.

Shoes. "Jootha." From Sylhet.

Slippers. From Cachar.

N.W. Provinces Local Committee.

Caps (12) and turbans (3). From Allahabad.

Suits of clothes (12). For both sexes. Allahabad.

"Burga." Veil worn by Kashmiri women. Allahabad.

The "burka" or "burga" is not a veil, but a cylindrical bag for the head, with holes covered with network, through which the wearer sees and breathes, a pleated skirt attached to the head bag covers the whole figure downwards. The woman so encased looks like a mummy, and is of course invisible to eyes profane. The whole dress is made of coarse white cloth.

"Chudder" or wrapper. For women. Allahabad.

Shoes (12 pairs). For both sexes. From Allahabad.

Dr. Leitner, Lahore.

Dresses, caps, girdles, boots, stockings, &c. from Dardistan, Tibet, Central Asia, and Northern India.

Under this head fall many of the articles described in the Ethnographical Catalogue of Curiosities, to which have now been added a list of Indian articles.

Bengal Local Committee.

8,032–3. Gloves and stockings from Chittagong.

Mysore Local Committee.

Turban, silk with gold stripes.

Coorg head-dress.

N.W. Provinces Local Committee.

Pugrees or turbans (5). Benares and Boolundshuhan.

Indore Local Committee.

Leopard and buffalo skins.

Colonel Michael, London.

Rugs (3). Tiger skin, bear skin, and leopard skin.

GROUP VI.—LEATHER AND INDIA-RUBBER INDUSTRY.

SECTION I.—LEATHER AND ROUGH SKINS.

The leather prepared by the processes in general use among the natives is of a hard and coarse, but usually strong description. The shoes of the poorer classes, leathern water vessels, and to some extent, harness and saddlery are almost the only objects to which leather is applied.

The demand for leather of a finer and better quality is but slight, and no attempts are made at the improvement of the present rude method of tanning (*vide* note appended to specimens of leather exhibited by Commissary of Ordnance, Cawnpore), or at the introduction of the processes of varnishing, enamelling and polishing. As a natural result, where excellence of workmanship and costliness of material is required, cloth and gold embroidery are substituted for leather in native saddlery, &c. The skins commonly prepared are those of the goat, calf, bullock, and camel, that of the last drying into a very hard compact hide, which is made into "Kuppas" and oil vessels. The best leathers are those made at Peshawur or brought from Kabul, where the process of communicating a fine turquoise blue to leather is successfully practised in a kind of imitation morocco leather. Núrpúr, in the Kangra district, is celebrated for its red leather called "lakki." Kangra is famous for a soft leather which is made into the *pyjama* or trousers worn by the hill people in the neighbourhood. At Kangra also the art of dressing the skins of wild animals of the chase is dexterously practised.

Raw hides, dried and limed, form a considerable article of the export trade of India, the traders being both native and European, who employ their own agents (Chamars) travelling about the country, collecting the skins from the resident chamars in the villages.

Maistry H. Shunkariah, Hoonsoor.

Tanned buffalo and bullock hides.
Tanned Sambur skin.

Commissary of Ordnance, Cawnpore.

Buffalo and cow hides. Tanned and curried.
Goat and sheep skins. Tanned and curried.
Cow hides. Japanned and enamelled.

Samples of leather in different stages of manufacture (mounted in wooden frame).

Tanning and currying materials.

The staple manufacture of Cawnpore is leather. An extensive trade is also done in the manufacture of saddlery (for the use of Government), boots, shoes, and other leathern articles.

The process of tanning consists in soaking the skins in lime water for some days to loosen the hair and surface of the skin; the hide is then scraped, and after washing is sewn up in the form of a sack, which is filled with babool bark (Acacia arabica); it is then exposed to a constant stream of water, which forces the astringent matter into the pores of the hide very rapidly; but to make the process still more rapid the hide is taken out, wrung, and refilled every four or five days. While still damp the skins are spread on the ground and rubbed on both sides with a wooden block or mallet furnished with a handle. A hide can be ready in this way in about a month, but the leather is inferior in strength, durability, and pliability to English leather.

Indore Local Committee.

Leather (6 specimens), plain and coloured.

SECTION II.—LEATHER WARES.

Commissary of Ordnance, Cawnpore.

Harness, lead, double (2 sets), consisting of :—
Bits, collars, cruppers, girths, stirrup iron and leathers, leggings, munnahs, pannels, buckling pieces, reins, saddles, straps, surcingles, rope traces, wallets, whips, and iron logs.

Saddlery, Artillery and Cavalry (1 set) consisting of :—
Bits, bridles, shoe cases, cruppers, collars, stirrup irons and leathers, pannels, reins, munnahs, saddles, straps, surcingles, wallets, and saddle-trees.

Harness, breast, mandes pattern (1 set), consisting of :—
Breast pieces, straps, and traces.

Harness wheel, double set (1) consisting of :—
Bands, bits, breechings, collars, cruppers, girths, hames, stirrup irons and leathers, leggings, pannels, buckling pieces, reins, saddles, straps, surcingles, traces, tugs, wallets, whip, iron logs, and kicking straps.

Honourable R. Bourke, London.

Afghan saddle and stirrups.

GROUP VII.

SECTION I.—GOLD AND SILVER WARES AND JEWELLERY.

Madras Committee.

Collection of personal ornaments used among the Khond tribes in Gumsoor and Chinna Kimidi Maliahs of Ganjam, consisting of :—

Brass bangles, for hands (10).
Brass leg ornaments (6).
Brass finger rings (8).
Brass ear-rings (20).
Brass nose-rings (2).
Brass beads.
Brass leaf.
Brass comb.
Straw beads.

"Salagram" necklace. From Hassam. Obtained through Capt. J. S. F. Mackenzie, who sends the following note :—

> Salagram.—A stone, a species of Ammonite, common in the Gandhak river, and worshipped by the Vaishnavas as a type of Vishnu. *Sa*, with ; *ora*, a ring ; *gram*, multitudes.—*Wilson's Dictionary.*

"There is a certain stone of high mystical virtue, and for the same reason consecrated to Vishnu, called Salagram, in which the Hindus imagine they discover nine different shades emblematical of his nine incarnations. It is found in the river of Casi, a branch of the Ganges, is very heavy, oval or circular in its form, and in colour it is sometimes black and sometimes violet. Only a small cavity appears on the outside, but within it is hollow and almost concave, being furnished in the interior coats above and below with spiral lines which terminate in a point towards the centre.

"These stones are very rare and costly ; when they are quite black and represent the gracious transformations of Vishnu, especially under that of Krishna, a Sanskrit name signifying black, they are inestimable ; but when they are tinged with violet and represent his angry incarnations, as under the form of a man-lion, or the Rámávátárás, they are of less value.

"The Salagram is piously preserved in the temples of the Vishnuvites, and is to them what the Lingam is to the Sivites. The ceremonies performed to these stones are nearly similar ; they are equally borne about, as somewhat superlatively precious, in the purest white linen ; they are washed every morning, anointed with oils, perfumed, and solemnly placed on the altar during divine worship ; and happy are those favoured devotees who can quaff the sanctified water in which either has been bathed."—*Maurice's Indian Antiquities.*

Every Brahmin except those who wear the Lingam, has at least one Salagram in his house.

Necklaces similar to the present specimen are part of the ornaments which adorn the different images which represent Vishnu.

Counting the stones from the one next the hook.

No. 1 is called Seetárámá.
No. 2, Vásudéva.
No. 3, Vásudéva.
No. 4, Janàrdana.
No. 5, Narasimha (Man-lion).
No. 6, Narasimha (Man-lion).
No. 7, Narasimha (Man-lion).
No. 8, Narasimha (Man-lion).
No. 9, Shéshá.
No. 10, Narasimha (Man-lion).
No. 11, Narasimha (Man-lion).
No. 12, Matsia (fish).
No. 13, Nàràyana.
No. 14, Shéshá.
No. 15, Shéshá.

Madras Committee.

A set of Cuttack silver filagree ornaments, consisting of a necklace, brooch, and pair of bracelets. Cuttack.

Gold wire chain. From Trichinopoly.
Silver anklets. From Madras.
Silver "Goolab Peish" (rose-water sprinkler). Madras.
Silver "Attar dhan." From Madras.

A casket filled with vases for holding attars or perfume essences.

Hookah (of metal) inlaid with silver and having a gilt "Natcha" (stem). From Beeder.

Messrs. P. Orr and Sons, Madras.

Bracelet of Jeypore. Enamels set in gold.

Messrs. Alland and Co., Madras.

Silver filagree bracelet, necklets (2), and comb ornament.

Bouquet holder. Silver filagree.
Bouquet holder. Tiger's tooth, mounted in silver.
Card basket, cigar-case, and tumbler-cover. Of silver filagree.

H.H. the First Prince of Travancore.

Card-cases (2). Silver filagree (1), with a peacock on one side and an Indian lute on the other (2), with scrolls, flowers, &c.
Silver bracelet.
Silver bracelet, with Nagátali seeds.
Silver bracelet, kalachi flower (Gloriosa superba) pattern.
Silver bracelet, Erukku flower (Calotropis gigantea) pattern.
Earrings (2 pairs), Erukku flower (Calotropis gigantea) pattern.
Breast-pin. Pavalkai (Momordica) pattern.
Breast-pin. Peacock pattern.
Breast-pin. Indian lute.
Breast-pin. Palankeen.
Breast-pin. Bunch of cashew nuts.
Breast-pin. Silver filagree.
Breast-pin (2). Copper-gilt perforated arabesque.
Hair pin. Erukku flowers.
Hair pin. Naga image pattern.
Lady's riding whip. Silver and partly gilt.

Jug. Solid silver, and partly gilt perforated arabesque.

Fruit-dish and cups (2). Silver gilt kuftgari (steel inlaid with gold).

Cup. Silver inlaid, dark green marble.

Native Employé of Messrs. Orr and Sons, Madras.

Silver fruit-spoons with "Sawmy" (figure of an idol) handles, in morocco case (2 sets of 6 spoons each).

Madras School of Art.

Salver. Silver embossed; Hindu design.

Jeweller Vithelingum, Trichinopoly.

Bracelet, studs, and earrings (2 pairs). Gold, "Sawmy" pattern.

"Sawmy" is a name given to idols in the south of India.

Chain (1½ yards in length) and bracelet. Gold; "*rose*" *pattern.*

Rose-water sprinklers (2). Silver.

Cigar-cases. Silver.

"Ramasawmies" (2). Silver.

Jeweller Ruthanum, Trichinopoly.

Locket. Gold; "Sawmy" pattern.

Bangle. Gold embossed.

Sleeve-links. Gold.

"Sawmy" bracelet. Silver.

"Sawmy" goblet. Silver embossed.

Gun, "Ramasawmy."

Scent goglets (1 pair). Silver.

Jeweller Servia, Madras.

Gold embossed "Sawmy" armlets, "Venkie."

Gold necklet of Pagodas, "Casimalai."

Gold necklet, with jewelled centre, "Saredd Addegai."

Silver gilt "Sawmy;" native lady's Chatelaine.

Bombay Committee.

Tray of Head ornaments (5). From Dharwar. Worn by all the higher classes of Hindoos.

A set of apparatus (in silver), used in the keeping and preparation of the betel-nut (Areca catechu) for eating, consisting of:—

A tray "tubuck" for holding the leaves of the betel-pepper, with which the nuts are eaten.

A "Pandan" or box in which the betel-pepper leaves are kept.

A "Chowfula" in which cardamoms, cloves, &c. are kept.

A "Chunal" in which "chunam (lime) is kept.

An "Adkitta" or betel-nut cracker.

Badroodeen Abdoolally, Bombay.

A collection of imitation ornaments, in 5 trays, as follows:—

Tray I.

1. "Zermee." Necklace. Worn by Kutchees, Marwadees, Loowanas, &c.
2. "Ballies." Earrings. Worn by the Kutchees and other inhabitants of Guzerat.
3. "Koodee." Earrings. Worn by almost all classes of Hindoos.
4. "Sulla Angattee. Ring. Worn by all.
5. "Surry." Neck ornament. Worn by the higher classes of Hindoos in the Deccan.
6. "Jowhar." Necklace. Worn by the higher classes of Hindoos in the Deccan.
7. Buttons for jackets.

Tray II.

1. "Toolsey Putty." Necklace. Worn by all the higher classes of Hindoos in the Deccan.
2. Set of "Bangadees" or Bangles (wristlets). Worn by all the higher classes of Hindoos in the Deccan.
5. "Patlies." Wristlets. Worn by all the higher classes of Hindoos in the Deccan.
6. "Wakies." Armlets. Worn by all the higher classes of Hindoos in the Deccan.
9. "Saklee Kunthee." Necklace. Worn by all the higher classes of Hindoos in the Deccan.
10. "Kanthee Malla." Necklace. Worn by all the higher classes of Hindoos in the Deccan.
8. Set consisting of "Ketuck Phool" and "Chandrakora." Head ornaments. Worn by the women of higher classes of Hindoos.
3. "Bhickballies." Earrings. Worn by men of the lower orders, as Koombies.
4. "Naths." Nose rings. Worn by the women of lower orders as Koombies.
7. "Sakhalees" or "Todas." Wristlets. Worn by Hindoo children generally.
11. "Todass." Wristlets. Worn by Hindoos of both sexes.
12. "Kudloo." Anklet. Worn by Guzerathi females of lower order.

Tray III.

1. "Kullos." Anklets. Worn by Kutchi women.
7. "Paijaee." Anklet. Worn by Guzerathi women.
8. "Todac." Anklet. Worn by women of Guzerat and Deccan.
5. "Kudloo." Anklet. Worn by Guzerathi women of lower order.
2. "Wakees." Armlets. Worn by women of the lower order in the Deccan.
6. "Surry." Neck ornament. Worn by women of the lower order in the Deccan.
3. "Kargotas." Waist chain. Worn by men of the lower order in Guzerat and the Deccan.
4. "Kadas." Wristlet. Worn by men of the lower order in Guzerat and the Deccan.

Tray IV.

1. "Kadha." Armlet. Worn by men.
2. "Angathee." Ring. Worn by all.
3. "Bijora." Forehead ornaments. Worn by Kutchi women.
4. "Chumpa Kaleebar." Necklace. Worn by Kutchi women.
5. "Gope." Necklace. Worn by Guzerathis and Marwadies.
6. "Tandley Pote." Necklace. Worn by women of the higher order.
10. Set of bangles (wristlets). Worn by women of the higher order.
8. "Pootalee Malla." Necklace. Worn by women of the higher order in the Deccan.
14. "Patlies." Wristlets. Worn by women of the higher order in the Deccan.
8. "Mangathi." Wristlets. Worn by Mahomedan ladies generally.
12. "Jallichi bangadi." Wristlets. Worn by Hindoo and Mahomedan women.
11. "Kadas." Wristlets. Worn by the men and women of Guzerat and the Deccan.

13. "Angoothi." Ring. Worn generally by the people of Kutch and Kattyawar.
7. "Bickhaballies." Earrings. Worn by men of the lower order.

TRAY V.

1. "Rancun." Wristlets. Worn by Hindoo and Mahomedan women.
7. "Jalichi Bangadi." Wristlets. Worn by Hindoo and Mahomedan ladies.
8. "Todas." Wristlets. Worn by Hindoo and Mohamedan ladies.
5. "Pochayhar." Necklace. Worn by Hindoos of the higher order in Guzerat and the Deccan.
9. "Kunthee." Necklace. Worn by Hindoos of the higher order in Guzerat and the Deccan.
2. Earrings.
4. "Bangadies." Wristlets. Worn by Mahomedan ladies generally.
3. "Ballies." Earrings. Worn by Bhatias and Looanas.
6. "Kooda." Ornaments. Worn by Bhatias and Looanas.
10. "Kulas." Anklets. Worn by the women of the lower classes in Guzerat.

Tray containing :—
Silver armlets (4 pairs).
Silver wristlets (1 pair).
Neckchain.

Tray containing :—
Wristlets (3 pairs).
Anklets (2 pairs).
Necklaces (2).

H.H. The Rao of Kutch

Silver goblets (1 pair).
Silver muffineers (1 pair).
Silver tea-kettle.
Silver tray.
Silver rose water sprinkler.

H.H. Meer Ali Morad.

A set, consisting of cup (with cover), saucer, and spoon, in silver. From Kairpoor.

Bengal Committee.

A series of tinsel imitations of the characteristic personal ornaments worn by the natives of Bengal. Presented to the Vienna Exhibition by the late Baron Dowleans :—

1. "Jhumko-dhenri." An earring.
"Jhumko," the passion-flower, and "Dhenri," a poppy-head; the ornament consisting of a string of such forms.
2. "Jasam." An armlet.
The "Jasam" is a favourite Mahomedan form of armlet.
3. "Hele-hara." A necklace.
"Hele" is the name of a long thin snake, to which this ornament bears some resemblance.
4. "Sinti." An ornament for the forehead. Generally worn by brides.
5. "Gota." A waist chain.
Worn somewhat lower than the waist: it generally crosses the hips and loins. To it is often attached a smaller chain for keys, &c.
6. "Churi." Bracelets.
Churi are thin rings of gold, silver, lac, or glass, worn on the wrists. Sometimes the churi is set with jewels.

Bengal Committee.

A collection of imitation ornaments, made in the Calcutta Bazaar, as follows :—

"Kantha-mala." Necklace.
"Champa-kali." Necklace.
"Goupa-hara." A necklace.
The necklace of the Gopis of Braja.
"Dama-hara." Neckchain.
"Panchnaris" (3). Neckchains.
"Chicks" (2). Neckchains.
"Bala." Bracelets (8 varieties).
The "Bala" is a favourite form of bracelet. It is made both in gold and in silver, and is sometimes jewelled.
"Bauti." Bracelets.
The "Bauti" is the most esteemed ornament of the Hindu lady, but it is nevertheless falling into disuse.
"Churi" (2 pairs). Bracelets.
"Dam-dam Churi." Bracelets.
"Baugri Churi." Bracelets.
See note above on "Churi."
"Tar Churi." Bracelets.
Formed originally of palm leaves, hence its name.
"Narkal-phul." Bracelets.
"Mardana." Bracelets.
"Lavanga-kali." Bracelets.
"Lavanga-kali," "clove-buds." A string of small ornaments, each one of which is of the form of the bud of the clove-flower.
"Tábij." Armlets (2 varieties).
"Tabij" literally means to hang, and properly it is to the pendants to the armlet that the name applies.
"Taga." An armlet.
"Taga" is literally the thread tied on as the record of a vow to some god.
"Murki-maduli." An armlet.
A "Maduli" or "Manduli" is a small case for containing *Yantras* or charms. Its form is generally either prismoidal or barrel-shaped. "Murki" is the name given to torrefied grains of rice used as a sweetmeat. A "Murki-maduli" ornament is a string of murki-shaped charms.
"Madi." Ear-rings.
"Chondani." Ear-rings.
"Patbali." Ear-rings.
"Makri." Ear-rings.
"Tanjar." A chain.
"Kanta." A hair-pin.
"Mathar-phul." Head ornament.
"Chandra-hara." Chain worn across the hips.
"Chandra-hára," so called from the circular discs or "moons" which form a conspicuous part of the chain design.
"Viche." A chain worn across the loins.
"Mala." Anklets.

Silver Kooki ear-rings. (A string of champa buds.) From Cachar.

Ornaments worn by Sonthali women. From the Sonthal Pergunnahs.

Necklet or collar ("hansulee"), wrist ornaments, finger-ring, and anklets ("banki").

These ornaments are not peculiar to the Sonthalis. They are in use in almost all parts of Bengal. The finger-ring is the same every-

where, with only this difference, that the more advanced the people, the less clumsy is the design and workmanship of these ornaments. The ornaments for the wrist are the same as are worn by the Urias and the people of Dacca and Sylhet. The "Hansulee" is much used by the Muhammadans of Bengal. The ornament is, as the name implies, very like a *henso*, an edged instrument used for cutting cocoa-nuts.

Babu Sridhur Sahi, Zemindar of Maujha.

An "attardan" (perfume casket). Gold and silver filagree. From the Sarun district.

N. W. Provinces Local Committee.

An armlet. Gold set with diamonds. Worn above the elbow.

A necklet. "Sutlara." Gold and gems.

A necklet. Chumpa kullee. Gold.

Bracelets (2 pairs). "Kungun." Gold and enamel. Worn at the wrist.

Bracelets. "Pounchee chuadandi" (with beads shaped like rat's-teeth). Gold. Worn at the wrist behind the bangle.

Bracelets. "Churi." Gold. Worn at the top of the fore-arm below the elbow.

Bracelets. "Ponnchee." Gold.

Bracelet. Gold and filagree.

Brooch. Gold filagree.

Mouth-piece for hooka (pipe). Silver.

Cardamom box. Silver.

Scent-bottles (2). Characteristically worked in the form of a fish. Silver.

Imitation ornaments, as follows:—

Necklets (5). Ear-rings (2 pairs). Nose-rings (2).

Bangles or wristlets (2 pairs). "Churi" bracelets (7 pairs).

Necklace of Brahminical beads. "Mala" and thread.

Anklets (2 pairs). From Etawah.

Ornaments for lower classes of women (10 sets). From Benares.

Punjab Committee.

Scent bottles (pair). Silver gilt.

Scent bottles (pair). Silver and enamelled work.

Cups (2). With and without covers.

Necklace.

Neck pendants (2). Silver.

Puzzle-rings (3) and thumb-ring (arsi).

Caskets (2). Brass, silvered. Karnal district.

Sword-handles (3). Jade, jewelled. Lahore.

Cups (3). Jade, engraved. Lahore.

Buttons (2). Set with turquoises and red stone. From Lahore.

Toe-rings and finger-rings (30). Silver and enamel. From Multan.

Flagon and jug. Silver and enamel. Multan.

Goblets (2). "Surahi." Chased silver and gilt. Kashmere.

Saucers (2). "Rikabi." For the above. Kashmere.

Cups (2). "Nyala." Kashmere.

Amritsar Local Committee.

Russian teapot. "Somawar." In chased silver.

Ghulam Ahmad, Jammu.

Necklace. "Kantha." Consisting of diamonds (156), rubies (53), and pearls (916).

This necklace was presented by Shuja-ul-Mulk, King of Kabul, to Runjit Singh, during his residence in the Punjab at the time of annexation by the British Government. It was sold by public auction, and bought by Shekh Imám-ud-din, Viceroy of Kashmere. At his death it was sold to a merchant, who broke it up, and sold it piecemeal. The present owner collected all the pieces, and restored it to its original form.

Crystal looking-glass. Back composed of jade, stone, rubies, and gold.

Was plundered at Delhi by Nadir Shah, who took it back to Persia. From thence it fell into the hands of Shujá-ul-Múlk, who gave it to Ranjit Singh. It was sold by public auction, and was bought by a merchant, through whom it came into the possession of the present owner.

Ghulam Ahmad, Jammu.

Bangles (10 pairs). "Churi."

"Churi" generally consist of a flat ribbon of gold or silver, which are bent round the wrists.

Bangles (3 pairs). "Kara."

The "Kara" is a bracelet of stiff metal, worn bent round the arm; when the edges are serrated it is called "gokru."

Forehead ornaments (2). "Dámin."

It consists of a fringe hanging over the forehead on either side of the face. Sometimes richly jewelled.

Necklaces (2). "Guluband." Jewelled collars.

Necklace. "Champakali." Collar with pendents.

Necklaces (3). Diamonds and rubies.

Necklace. With large sapphire.

Necklaces (7).

Armlets (2 pairs). "Bazuband."

A broad belt-like ornament, generally mounted on silk, and tied on the upper arm.

Bracelets (1 pair).

Ear-rings (3 pairs).

Nose ornaments (4).

A "lawung" is a small stud let into the flesh of the nostril on one side, generally of gold, with a pearl or turquoise in it.

Emerald ring.

Turquoise rings (5).

Snuff-box, onyx.

Russian tea-pot. "Samawar." Silver.

Jug. Jade stone.

Betel-nut box. Silver.

Hukka and hukka-bowl. Silver.

Kishen Chand and Balamakund.

Set consisting of bracelets, necklace, ear-rings, and brooch. Green emeralds.

Necklace. "Guluband." (Jewelled collar.) Gold and turquoise.

Necklace. "Kanthá."

Necklace. "Champakali" (with pendants shaped like the long-pointed buds "kalli" of the jessamine "chamba").

Jowahir Lal.

Necklace of seven strings. "Satlara."

Necklace. "Champakali."

Sohan Lal and Banki Rai.

Bracelets. "Kara." (A bracelet of stiff metal worn bent round the arm.)

Harakh Chand.

Bracelets. "Kara."

Chammam Lal.

Set consisting of bracelets, necklace, ear-rings, and brooch. Babool work.

The "babul" work (so called from its resemblance to the flower of the Acacia arabica ("babul") is the most original and characteristic of Delhi jewellery. It is called by the native workmen "Khárdár," literally work of thorns (Khár) or points. Gold ornaments (generally spherical, or in such a form that a number of circular convex pieces can enter into the pattern) are covered all over with a number of minute golden points, and then this surface is frosted. *Vide* "The Manufactures and Arts of the Punjab," by H. Baden Powell.

Pyare Lal and Janki Das.

Necklace. "Kantha."
Set of silver ornaments.
Bracelets (3) and brooch.

Pyare Lal and Mulchand.

Bracelets. Gold.
Bracelets. Pearls and turquoises.

Dr. Leitner, Lahore.

Yarkandi chop-sticks in silver, with jade ornaments, flints, and Suleymanié, and other stones attached.

The Yarkandis use Chinese instruments, having been so long under them. Hotels are common in Eastern China, and have chop-sticks fastened to the tables. Many Yarkand articles have Chinese marks on them.

An exquisitely executed silver inkstand and salver, with a Persian inscription, containing paper cutter of Koftgari (steel inlaid with gold) workmanship; also curious scissors of the same, and inkspoon made of silver (in imitation of a fish). Lahore, Delhi, and Guzrat workmanship.

A substantial box to contain the same lined with velvet. Lahore workmanship.

A Huka top, in silver, made in imitation of a Lotus (like which it opens and shuts), with enamel and little figures of birds on silver chains attached to it. Ludiana workmanship.

A Huka (waterpipe), after a rare model, in pure gold, with coil attached and golden mouthpiece. Done at Malehr Kotla.

A silver jug, carefully worked by hand, from Ludiana.

A silver card case, with figures neatly worked, from Hyderabad, Sind.

A napkin ring and thimble from Hyderabad, Sind.

A Sikh mace, borne in processions after Rajahs, now rare. Good specimen of Punjab workmanship, both in inlaying gold in steel and of lacquering wood.

Dr. Leitner's Sikh mace, which used to be borne on public occasions behind Rajahs, is an excellent specimen, besides being interesting in itself, of the work of inlaying steel with gold. It rests on a beautiful wood stem beautifully lacquered. It has been presented by the owner to the Vienna Museum for Art and Industry, to which he had, on a previous occasion, given a considerable number of similar articles of Punjab manufacture, as also a Sikh dagger or katai, a curious instrument, often inlaid in the middle of the blade with pearls. It is used straight from the shoulder and has two bars which protect the side of the hand.

Koftgari Work.

(Steel inlaid with Gold.)

Process of Manufacture.—The pattern on the steel is engraved by the hand with a fine-pointed tool, called "cherma." The gold is beaten out into a very thin wire, which is laid into the design so engraved. The surface is next scraped to an exact level, by an instrument called "Tor" or "Silat." The article is then exposed to a moderate amount of heat, and when taken from the fire is rubbed and polished with a smooth stone called "mohari," (Punjab Catalogue). Koftgari work is produced chiefly in Goojerat and Sealkote, in the Punjab; that of the latter place being distinguished by higher finish. It was formerly much in vogue for the decoration of arms, but as the manufacture of arms has been generally discouraged since the rebellion in India, its application is now chiefly confined to the ornamentation of fancy articles, such as paper-knives, paper weights, jewel-caskets, &c.

Kutbdin.
Mohammad Yar.
Imamdin.
Neazdin.
Abdur rahman.
Gholam mohiodin.
Nurdin.
Imam baksh.
Budah.
Kallu.
Omar buksh.
Fuzldin.
Ghulam hussen.
Ghulam jilani.
Ghulam Mohammad.
Hyat Mohammad.
Kutbdin (2nd).
Sharfdin.
Omar buksh (2nd).
Ata Mohammad.
Ismail.
Mohammad buksh.
Rahim buksh.
Elahi buksh.
Karamdin.
Badr-din.
Abdur rasul.
Buddah.
Allah baksh.
Buddah, son of Nur Ahmad.
Buddah, son of Nur Mohamar.
Nyazdin (2nd).
Devi Sahai, and Chamba mal.

} Articles of Koftgari (steel inlaid with gold), such as—

Armour. Complete suits of plate and chain mail.

Weapons. Swords, shields, scimetars, knives, daggers, hatchets, blunderbusses, &c.

Fancy articles. Jewel-caskets, trays for various purposes, as card trays, ash trays, trays for rings and pens.

Paper knives, paper and envelope cases, candlesticks, betel-nut boxes "pandau," betel-nut cutters, &c.

From the Punjab.

Oude Local Committee.

Diamond bracelet. "Rurrah."
Gold bracelet.
"Meena" bracelets (3). Enamelled glass.
Bangles (21 pairs). Wristlets. Gold and silver.
Necklaces (7). Silver, gilt, metal, &c.
Brooches (3) and ear-rings (3 pairs).
Silver "Soorains" (14).
Silver goblets (2).
Silver muffineers (pair).

Rangoon Local Committee.

Gold and pearl pendant for the neck. Worn by Burmese women.
Gold pendant for the neck. Worn by Burmese women.
Massive gold necklace. Worn by Burmese women.
Gold necklace. Worn by Burmese women.
Gold ornament for the hair. Worn by Burmese women.
Gold earrings "nadoung." Worn by Burmese women.
Gold bell-shaped earring. Made at Prome for European wear.

Mysore Local Committee.

"Ryákadi." Ornaments (in gold and silver) worn by women at the back of the head.
"Kyadige." Ornaments (in gold and silver) worn by women at the back of the head.
"Jedé Billé" (2). Ornaments (in gold and silver) worn by women at the back of the head.
"Chauri Kuppé." Ornaments (in gold and silver) worn by women at the back of the head.
"Kuppé" (2). Ornaments (in gold and silver) worn by women at the back of the head.
"Bavalis." Gold ear-rings.
"Válé." Gold ear-rings.
"Kangani." Bracelets (3 pairs, in gold and silver), worn bent round the arm.
"Bajuband." Broad belt-like ornaments worn by women above the elbow.
"Addiké." Gold necklaces.
"Gundina Sara." Gold necklaces.
"Vankai." Bracelets (silver) worn by women above the elbow.
"Nágamurigé." Bracelets (silver) worn by women above the elbow.
"Tólu Táyiti Bandi." Bracelets (silver) worn by women above the elbow.
"Pádaga" (3). Anklets. Silver.
"Ruli." Anklets. Silver.
"Kalugejje." Small round silver bells worn with anklets.
"Pilli" (4). Toe-rings.
"Udidhara" (3). Silver ornaments worn by men round the waist.
"Karadigé." Silver ornaments, with the god Siva placed inside. Worn by Lingáyets.
"Linga." Silver ornaments, with the god Siva placed inside. Worn by Lingáyets.
"Táyiti" (2). Money-boxes. Silver.
"Sunnakayi." Chunam (lime) box. Silver.

Bhopawur Pul Agency.

"Rakhdee." Tin ornament for the head. Worn by women.
"Bor." Tin ornaments for the forehead.
"Bindee." Tin ornaments for the forehead.
"Dur." Tin ear-rings.
"Jhumka." Tin ear-rings.
"Totie." Tin ear-rings.
"Bali." Brass ear-ring.
"Bali." Brass and glass ear-ring.
"Jhumka" (No. 2). Grass ornament for the ear.
"Nath." Nose-ring. Brass.
"Chir." Grass beads. Red, black, and olive.
"Har." Cowrie shell necklace.
"Patria." Tin armlets.
"Bajria." Tin armlets.
"Jhela." Tin armlets.
"Choora." Pewter elbow-rings.
"Kakun." Pewter elbow-rings.
"Dal." Tin elbow ring.
"Loria." Pewter bracelets.
"Goojria." Pewter bracelets.
"Kara." Pewter bracelets.
"Bangree." Glass bangles (wristlets).
"Bitee." Finger-rings. Brass, copper.
"Ghoongralia." Pewter bangles with bells, fastened below the knee (ghoongralia).
"Jhanjree." Pewter bangles with bells, fastened below the knee (ghoongralia).
"Kara." Pewter bangles or leg-rings.
"Pinjan." Brass toe-rings.
"Bischia." Brass toe-rings.
"Goolobdani." Rose water sprinkler. Imitation of paddy-bird.

India Museum.

Collection of Hindoo ornaments from Madras (from the London Exhibition of 1871).
The following articles are from the London Exhibition of 1872:—
A set of ornaments exhibited on lay figure, from Oudh.—
Gold pendants (3).
Ear-rings, silver and coral, worn by men.
Ear-rings, worn by both sexes.
Gold amulets or charms (2).
Bracelet (man's).
Anklets, silver.
Set of toe-rings (10). Silver.
Silver lamp.

Baboo Faquir Chund, collector of Benares.

Necklet, pearls (128).
Necklet, "Sathlarha," pearls (650), diamonds (9), and rubies (35).
Looking-glass frame composed of jade, diamonds, and rubies.

Baboo Buctawan Singh, Benares.

"Urapsee" necklet with pendants, 68 pearls.

MRS. RIVETT-CARNAC.

COLLECTION OF ORNAMENTS WORN BY THE NATIVES OF INDIA. (From the London Exhibition of 1872.) The jewellery in this collection is of glass and gilt.

A.—HEAD ORNAMENTS.

1. "Seethee" or "Bindee." Head ornament. Worn by Hindoo and Mahomedan women in Upper India.

   This specimen is made in lac, and is worn by the lower classes only. It is an imitation of the costly gold and jewelled ornaments of a similar shape worn by the rich. The centre point falls back over the hair, and the rosettes are fastened into the ears. These lac ornaments are much worn in Bundelcund (Central India). The lac bracelets in this collection are worn by the same classes. Stick lac is procured in the jungles, and is manufactured in the towns and villages. There are large manufactories of shell lac under European superintendence at Jubbulpore and Mirzapore. A considerable quantity of shell lac is annually exported from India *via* Calcutta and Bombay.

2. "Seethee" or "Bindee." A head ornament in silver similar to the above, and worn chiefly by Hindoos.

   The triangular centre-piece hangs over the forehead, and is fastened back into the hair by the chain and hook. The large bosses are fixed into the ears.

3. "Bandnee."

   Head ornament somewhat similar to the above-mentioned ones, made of pewter, worn by the lower classes of Hindoos only. The higher classes wear similar patterns in gold and silver.

6. "Seethee" or "Seventee." This is an imitation pearl and diamond head-dress worn by Hindoo women.

   The pattern is supposed to represent the blossom of the "seventee," a flower much used in their religious ceremonies. It is worn in the same manner as the before-mentioned head-dresses. These imitation ornaments are chiefly manufactured in Delhi, Benares, and other large cities.

7. "Seethee" or "Seventee."

   Pendant imitation jewel, worn singly on the forehead, by both Mahomedans and Hindoos, but as a rule worn by the children, both girls and boys.

8, 9. "Bindees."

   Worn by all classes, but more especially by the Mahomedans.

10. "Jumka."

    Worn by Hindoo women in the Hills; the chains are worn across the head, the bell-ends fall over the ears.

11. "Jumka."

    Worn by Hindoo and Mahomedan women, twisted in the back hair. This is a lac imitation of the more costly kinds.

12, 13, 14, 15. "Juma."

    Jewelled ornaments. Worn by Mahomedan women, falling low over the forehead.

16. "Juma." A similar ornament in gilt and turquoise.

    A very handsome jewelled one displayed by a Benares jeweller had, as pendants, repetitions of an open hand, the crescent and a star, and a feeble imitation of these designs may be traced in the ornament here exhibited.

17, 18. "Bij." Worn chiefly by Hindoo women in Bundelcund, fastened into the hair.

    These specimens are in lac, and belong to the same class of ornaments as the "seethee" and bracelets mentioned above.

19, 1, 2, 3. "Kaitucks." Worn by Hindoo women only.

    They are composed of three different ornaments; the round boss is worn in the centre of the hair, on the top of the head; the leaf-shaped and crescent-shaped ornaments are worn in front, towards the forehead. These ornaments are chiefly worn in the Maharatta country.

20. "Rakhdee."

    This is the centre piece of the "kaituck," and is worn, as already stated, by Maharattas and Madrassee women. The latter often wear from eight to sixteen smaller circles dotted about their back hair. They are fastened into the hair, sometimes by a spring or spiral twist, sometimes by a metal loop through which is passed a small plaited piece of hair. Hair pins, save as silver ornaments, are unknown.

21. "Parak." Turquoise head-dress. Worn by Ladak and Thibetan women.

    This head-dress, somewhat in the shape of a cobra's hood, is worn falling back from the forehead over the head, often to the waist, loaded with turquoise in the rough, and quaint cornelian brooches often engraved. A "parak" is a lady's dower, and until she has one of ordinary dimensions, a girl is supposed not to marry. The hair is plaited into long thin wisps intermingled to lengthen it with false hair made of wool; the different plaits meet at the waist, and there forming one single plait, they fall to the ankles, ending in a bunch of artificial hair similar to the tuft on a cow's tail.

22, 24. ——. Silver head-dress.

    Worn by the Hindoo women in the Koolu valley and other parts of the Himalaya. The silver boss and tassel hang down on the side of the head.

25. ——. Silver pig-tail.

    Worn twisted into the back hair, by both Hindoos and Mahomedans.

23, 26, 27. Head ornaments.

28, 29. "Kunthia."

    Worn by Hindoo and Mahomedan women, drooping over the side of the head, and usually attached by its chains to an equal number of ear-rings.

30, 31. "Kunthia."

    Commoner specimens of the same ornament.

39. "Ticka." Forehead marks. Worn chiefly by Hindoo women.

Widows are not allowed to wear them. The very small and better made are worn in the cities; the larger and commoner are worn by country folk.

37. "Teek."

Worn on the forehead by the bride only at weddings, and only worn by Hindoo women. The rich ladies wear them made of precious stones.

38. "Behna."

Forehead ornament. Worn by Hindoo women only.

40. "Sakadee."

Head ornament worn by married and unmarried Hindoo women of high caste. This ornament comes from the Madras Presidency.

B.—EAR-RINGS.

1 to 31. "Balee."

These are ear-rings of different patterns, all bearing the same name and worn by Mahomedan and Hindoo alike. These ornaments are always worn in the top of the ear.

33 to 44. "Jumka."

The name of this ornament indicates "shaking," and is best expressed by the word pendant, as those ornaments are nearly always worn attached to the "bala" or ear-ring, worn always from the middle of the lobe of the ear.

45, 47. "Bala Bijlee."

The word "bijlee" means lightning, and the constant glancing and shimmering of the light fringes has given rise to the expression. The Hindoo women always wear this ornament in the middle of the lobe of the ear, whereas the Mahomedans always wear it as an ear-ring is worn in Europe.

48 to 66. "Bala."

These ear-rings are always worn in the middle of the ear. The silver pair, numbered 63, are worn only by Mahomedans.

67 to 70. "Dur."

Worn by Aheers and the lower classes of Hindoos. The same classes wear the very heavy anklets, and are usually dwellers in the country.

71 to 100. "Kurrumphool."

Flower of the "kurrum," and supposed to be an imitation of the said blossom. These ornaments are worn by both Hindoos and Mahomedans, and fasten into the ear like a stud quite at the lower end. They vary in design greatly, some having pendants attached to them.

101 to 116. "Turkee," "Kurrumphool."

These are wooden specimens of the last-mentioned ornament, and are worn only by the very poor.

117 to 119. "Otays." Madras Presidency.

Of these ear-rings, No. 117 are worn by Brahmin girls only. Nos. 118, 119 are worn by Sudra women and girls.

122. "Murugoo."

These ear-rings are worn by little boys. Madras.

123, 124. "Oonapoo cathapoo."

Both these ear-rings are worn by married women and girls. Madras.

125, 126. "Navadam."

These ear-rings are worn by Sudra women. Madras.

127. "Thundatee."

Also worn by Sudra women only. Madras.

129, 130. "Poocheekoondoo." Worn by Sudra women and children. Madras.

132. "Tuti."

Worn through the lobe of the ear; silver. Rajpootana.

133. "Patia."

Worn in the lower part of the ear; silver. Rajpootana.

135. "Ballee."

These ear-rings are worn by the unmarried women of Ulwur. Rajpootana.

136 to 138. "Ballee."

Ear-rings worn by Burmese women through the lobe of the ear.

C.—NOSE-RINGS.

1 to 10. "Nathee."

Nose-ring. Worn by Hindoo and Mahomedan women.

13, 14. "Besur."

Worn by both Hindoos and Mahomedans.

16. "Keel."

Worn in the nose like a small stud by Hindoos and Mahomedans.

20, 21. "Chundak"

This ornament is fastened on to the large ring worn in the nose by Hindoos and Mahomedans.

23, 24. "Billakh."

Nose jewel. Worn by high-caste women and children. Madras.

25. "Mookeethee."

Nose-ring. Worn by all castes. Madras.

30 to 39. Nose-rings.

D.—NECKLACES.

1 to 9. "Kuntha."

No. 1. Fluted gold beads worn by Soubedars and Jamadhars; this class of necklace is chiefly worn by men and boys, Hindoos and Mahomedans.

No. 3. Worn by men only, and worn by (Marwarees) Hindoos, the chief trading class in the country.

No. 4. This ornament is worn by Hindoo women and children only.

Nos. 5 to 6. Are worn alike by Hindoo men and women in the Deccan.

Nos. 7, 8. Are worn on the neck by Hindoo men, chiefly Mahrattas.

No. 9. This ornament is worn by women, and, when in gold, especially by the Bengalees.

10 to 19. "Gope."

Nos. 10 to 14. Are worn by men and women alike, chiefly by Hindoos of the Bunniah or shop-keeping class; some few Mahomedans wear them. These ornaments are worn either round the neck or round the waist.

No. 15. Is worn by Mahomedan and Hindoo women alike.

Nos. 16, 17. Are worn by the rich nobles and Rajahs.

No. 18. Is worn by children round the throat, and comes from Kashgar, beyond Thibet.

No. 19. The beads forming this necklace are supposed to imitate the seeds or fruit of the Kumruck tree.

21 to 58. "Malla."

These necklaces are worn alike by Hindoo and Mahomedan men, women, and children. The word "malla" means something strung, and answers to our chaplet or garland. It is not uncommon to see pensioned sepoys with their medals strung thus, the ribbon having been discarded.

59 to 81. "Kutsullee."

Worn by both Mahomedan and Hindoo women. The bead ones are worn chiefly by the very poor.

83. "Tora."

This is a favourite ornament of the Marwaree men; the pendant is called a "joognoo" or firefly, whose flashing it is supposed to represent. It is sometimes, but seldom, worn by women.

84 to 94. "Hamael."

Both Hindoo and Mahomedan men and women wear this ornament. The silver one, No. 93, was sent in by a debtor in Oudh as his payment for rent.

95 to 105. "Chumpa Kullee."

This is supposed to be an imitation of the blossom of the "chumpa." It is worn by both Mahomedan and Hindoo women.

106 to 110. "Huslee."

This is worn by both Mahomedan and Hindoo women, and is a very favourite ornament. Scarcely any woman, however poor, is without one, either in silver or commoner metal.

111. "Chuntra."

This is worn principally by Mahomedans, and bears a name suggestive of the moon and stars.

113. "Sutluree."

Worn only in gold by Hindoo and Mahomedan women, and called by a name signifying seven chains.

114, 115. "Panchluree."

Worn by Hindoo and Mahomedan women, and also, on grand occasions, by Rajahs and Mahomedans of high rank; so called from being composed of five chains.

116, 117. "Chunan Har."

Moon necklace, so called from the gold circles supposed to represent the moon. Worn by Hindoo and Mahomedan women.

118 to 120. Necklaces.

121, 122. "Joognee."

Firefly ornament. Worn by Hindoo and Mahomedan women alike.

123*a* to 123*o*. "Joognoo."

Pendants. Worn by Mahomedan and Hindoo women.

124 to 130. "Taweez."

This is a species of charm. Sanskrit and Arabic incantations are written out and placed within the lockets. It is worn alike by Hindoo and Mahomedan women and childen.

131 to 133. "Nardullee."

Worn by boys and men, chiefly by Mahomedans.

134 to 150. "Kunthee."

These necklaces, common as they appear, are worn by Brahmins of high caste. They have a religious significance, and are sold in hundreds at the large religious fairs. The wearers, either men or women, adopt them as a sort of badge of superior sanctity, and are understood never to take them off; should they be broken or lost, they must be immediately replaced, as the wearer can neither eat nor drink or perform any religious ceremonies until they are replaced. This description applies only to the necklaces made of straw, pith, and of different small seeds or wooden beads; all other kinds included under the heading of "kunthee" are merely ornamental.

151. This necklace has no special name, and is worn chiefly by the children of the very poorest classes.

155. "Atekay."

These necklaces are worn by married and unmarried high-caste women. Madras.

156, 157. ——. Gilt chains.

Worn by high-caste women and little girls. Madras.

158. "Pulay karay."

This necklace is worn by Sudra women only. Madras.

159. ——. Gilt Bead chain.

Worn by Sudra women. Madras.

160 to 162. ——. Bead necklaces.

Worn by low-caste women and girls. Madras.

165. "Panhar."

Worn round the neck with place for looking-glass inside. Silver. Rajpootana.

166. "Hush."

Necklace worn by Kungea or vegetable sellers. These latter are Mussulmans. Rajpootana.

167. "Thalea."

Necklace. Worn by Chunbalis and low castes in Ulwur. Rajpootana.

E.—ARMLETS.

1–8. "Jerao, Naonugger."

Armlet worn above the elbow, so called from their being usually made of jewels, and nine gems being the usual number set. Both Hindoos and Mahomedans wear these ornaments.

9–14. "Attardhan" or "Bijreyet."

Worn above the elbow by Hindoo men only.

17, 18. "Joshun."

This ornament is also worn above the elbow by men, women, and children, both Hindoo and Mahomedan.

19–22. "Gungera."

Worn by Hindoo women only, chiefly Marwaree, Maharatta, and villagers; always worn above the elbow.

23–27. "Banhun."

Also worn above the elbow by all classes of Hindoo women.

30, 31. "Turreah."

Worn above the elbow by Hindoo women only.

32–35. "Bhank."

Worn by Hindoo and Mahomedan women and children above the elbow.

36–45. "Bajoobund."

Worn by Hindoo and Mahomedan women above the elbow.

46. "Bajoo."

Worn above the elbow by the Hindoo women of the villages and country side.

47. "Putee."

Also worn above the elbow by Hindoo women only.

49. "Bajoo."
This silver ornament is worn above the elbow on the arm muscle; to these are suspended the pendants called "goondees" or "soombahs." Rajpootana.

50. "Mandelia."
Seven grains or beads threaded on silk. Worn on the arm above the "bazu." Rajpootana.

51–53. "Goondees" or "Loombahs."
Pendants. Worn attached to the "baza." Rajpootana.

54. "Bhankedala."
Worn above the elbow, usually above an ivory circlet. Rajpootana.

58. ——. Brass armlets.
From Sumbulpore in the Central Provinces.

F.—BRACELETS.

1. "Gugra."
Bracelet. Worn next the hand by Hindoo women only.

2. "Rajahseye kukna."
This is worn like the preceding one, and only by Hindoo women.

3–7. "Nagoiree."
Worn next the hand by Hindoo and Mahomedan women alike.

8–19. "Ponchee."
These bracelets are worn in the same manner next the hand by Hindoo and Mahomedan women. Many have distinctive names apart from the general term "ponchee," according as they are supposed to represent rat's teeth, tree blossoms, or the bead-like seeds of either grains or shrubs.

20, 21. "Tora."
No 20 is worn on the wrist by Hindoo men only.
No. 21 is worn alike by Hindoo and Mahomedan men and women only.

22–27. "Chun."
These bracelets are almost exclusively worn by Hindoo women; they are worn in the centre of the "choories," either of lac or silver. The "choorie" being the small ornamented bracelet of which 8 to 10 and more are worn at a time. The "choories" are worn next to the wristlets.

28–33. "Kurrah."
These bracelets are worn by Hindoo and Mahomedan men and women. When worn by the women they are worn next the hand followed by the "choories," and above the "choories" next the elbow. When worn by men they are worn singly, and are usually merely the safest way of carrying wealth or savings.

34–44. "Kukunia."
These bracelets are also worn next the hand, and are chiefly used by Hindoo women.

45–48. "Kuttree."
Worn only by Hindoo women, and then always above the "choories" near the elbow.

49–54. "Panchluree."
These also are worn only by Hindoo women, and only in the manner just described as the termination to the "choories."

56–58. "Teesa."
Hindoo and Mahomedan men and women alike wear this ornament, but they are confined to the villages and country-folk classes. They are worn by the women next the wrist, and above the "choories."

59–63. "Puttah."
Worn only by Hindoo widows; some few Mahomedan widows wear them; these also are peculiar to the villagers and country people.

64–66. "Ponchee."
Worn by Hindoo women only, and always worn above the "choories."

67–73. "Puchua."
Worn above the "choories" by all classes of Hindoo and Mahomedan women.

76–85. "Agelah."
These brass bracelets are sometimes worn graduated up to the elbow; sometimes merely in pairs. They are only worn by the lowest classes of Hindoo women, Aheers, Koonbees, &c.

86–87. "Bala" or "Kuday."
Worn by Hindoo and Mahomedan women; these are worn next the hand.

89–94. "Putturee."
Worn by Hindoo and Mahomedan women and children. Worn in the midst of the "choories."

95. "Tintwarra."
These are worn by Hindoo women only above the "choories."

96–174. "Choories."
These bracelets are worn in all materials, and even a rich lady sees nothing incongruous in a massive gold wristlet surmounted by any number of lac and tinsel "choories." Mahomedans and Hindoos alike wear them. The lac "choories" have been left in exactly the order they are displayed for sale, and each roll contains a pair.
Nos. 170 and 171 were made by a worker of embroidered slippers, and are, he certified, worn by rich women, and only made to order.
No. 175 are ivory "choories" worn by the Brinjaries, or race of gipsies.
Nos. 135 to 145. These brass "choories" are worn almost exclusively by the washerwomen class; they may be seen with their arms loaded with these narrow circles from the wrist to the elbow.

176. ——. Bangles.
Worn by little boys. Madras.

180. ——. Bangles.
Worn by Naick women.

183. "Noagri."
Worn on the wrist, threaded on silk. Silver. Rajpootana.

184. "Noagri" "Gogradhar."
Worn on the wrist, threaded in sevens like the above. Silver. Rajpootana.

187. "Churra."
Mostly worn by Rajpoot women. These ornaments are in lac. Rajpootana.
Four pairs of "choories."

189. "Bullia."
This is made of "tamba," and worn on the wrist. Rajpootana.

194. "Ponchee."
This bracelet is worn by Meos and Chumbals of Ulwur. Rajpootana.

195–204. Bracelets.

G.—FINGER-RINGS.

1–5. "Gerow Arsi."
Worn by Hindoo and Mahomedan women on the thumb. Sometimes made to contain a looking-glass; at other times with a small reservoir for Alta.

6. "Kuraillee."
Worn chiefly by Hindoo women on the thumb.

7. "Angoostanee."
Worn by Hindoo and Mahomedan women on the thumb.

9–12. "Angotee."
Worn by Hindoo and Mahomedan women on third and little finger only; the custom is never to wear rings on the second finger.

13–16. "Chap."
Signet ring. Worn by Hindoo women only, and chiefly by the country folk.

17. "Goongeroo."
Worn by Hindoo and Mahomedan women on the third and little finger.

18. "Gerow," "Angottee."
Worn only by Hindoo and Mahomedan men.

19–21. "Challa."
Worn by Hindoo and Mahomedan women.

23. ——. Ring.
Worn by married women and girls. Madras.

24. ——. Ring. Worn by Naick women. Madras.

25. "Mundra."
Worn on the thumb with a place for cotton steeped in Alta. Silver. Rajpootana.

26. "Hatnphul."
Worn on the back of the hand with rings fitting on to the fingers. Silver. Rajpootana.

27. "Moondgee." Finger-ring.
Worn by Maos and Kunbalis, Ulwur. Rajpootana.

H.—JACKET.

1. "Angia." Small jacket. Ornamented with leaden bracelets sewed on.
This is worn by the lower classes only; the richer Hindoo women wear a simple unornamented jacket.

I.—ANKLETS.

1–9. "Pyree."
Worn round the ankle, chiefly by Hindoo and Mahomedan women of the villages and country side.

11–18. "Gutwhee," "Pyree."
These anklets are worn by the Hindoo women of the lowest classes only.

19–31. "Goongroo."
The name has reference to a tinkling sound, and is used for all ornaments to which small bells are attached, or which jingle in any way. These anklets are worn alike by Hindoo and Mahomedan women.

33, 34. "Churrah."
Worn by Hindoo and Mahomedan women of all classes; the richer wear, of course, silver. Hindoos, as a rule, except those of the Rajah's family, are not allowed to wear gold on their feet.

37–42. "Sankurrah" or "Tora."
These anklets are worn usually by Hindoo men, more rarely by the women; the same design is worn on the wrist occasionally.

44, 45. "Pyree Chun."
Worn by Mahomedan women only.

47. "Mull."
Worn by Hindoo and Mahomedan women; the women in Bengal are most partial to this ornament.

48–53. "Puonjéb."
Worn chiefly by Hindoo women; when in the common metals, they are worn only by the very lowest castes.

54, 55. "Kurree."
Worn by Hindoo and Mahomedan women.

56–59. "Bauhun."
These anklets are worn by Hindoo women only.

60–73. "Jehang," "Kurra."
Hindoo and Mahomedan women alike wear these anklets.

74–76. "Goongeroo Kurra."
In the Deccan these are only worn by Hindoo women.

77. "Maharatti Thora."
These little anklets are for a child, to be worn above the "kurra." Silver. Rajpootana.

78. "Pola Kurrah."
This is worn on the ankle under No. 77. Silver. Rajpootana.

79. "Tora."
Worn above the ankle. Rajpootana.

80. "Pail." Rajpootana.
Worn above the "kurra;" under which again is worn the "tora;" grains of shot are put into these ornaments to make them jingle.

81. "Neoree." Rajpootana.
These anklets are worn by Kumbas and Kungrees, Hindoos, and Mussulmans, Ulwar.

82. "Rumjole." Also worn by Kumbas of Ulwar, Rajpootana.

83. Worn in Sumbulpore, Central Provinces.

84. Silver anklet. Worn by the women of the North-west Provinces.
This pattern is supposed to represent the Cingara or water-nut blossom.

85 to 88. Anklets.

J.—TOE-RINGS.

1–18. "Aonta."
Worn on the big toe by Hindoo women only.

19, 20. "Challa."
Worn on the big toe by Hindoo and Mahomedan women alike.

21, 25. "Jornah." Worn by Mahrattee and Deccanee women only.
This ring is worn on the second toe.

27–38. "Pylanee."
This ornament is worn slipped over the second toe, and lying back on the foot; it is worn only by Hindoo women.

39–43. "Bichwa."
Worn on the second, third, fourth, and fifth toes by Hindoo women only.

44–47. "Chutkee."
Worn on the second, third, fourth, and fifth toes by Hindoo women only.

48 to 53. "Tilleah."
Worn only by Hindoo women on little toe.
56–58. "Bichwa."
Worn on the three middle toes on either foot. Rajpootana.
61. "Unwul."
Worn on the big toe. Rajpootana.
62. "Chattia Unwul."
Worn on the small and big toe, stretching over the "bichwa," worn on the middle toes. Rajpootana.
64. "Unwul."
Big toe-ring. Worn by Brahmins and Bunnyahs of Ulwur. Rajpootana.
65. "Chutki."
Toe-rings of sorts. Rajpootana.

K.—BROOCHES.

1–3. Brass brooches. Worn by the women in the mountains beyond Simla, towards Thibet.
This brooch is curiously like the ancient Irish brooch. It is used as the only fastening to the long woollen plaid which serves all the purposes of a dress to most of the village women. This plaid is most artistically arranged; first passed over one shoulder and under the other, it is fastened across the chest with the large brooch and chains; it is then wound round the waist as a skirt; and, as it is a good length when fastened by the woollen cords or waist bands, it falls plaited at the back more gracefully than any fashionable lady's pannier. Add to this long false plaits mixed in the hair and falling low over the shoulders, ear-rings from which depend long silver chains drooping with the hair and passed from ear to ear, a bright red bunch of wool, worn as a chignon and filling up the space between the plaits, the whole surmounted by a small red-crowned cap, a veritable pork-pie. Europe might learn a lesson in artistic simplicity from these village girls; few are good-looking, as we count good looks, but all possess a free careless grace, though upon them falls the entire burden of work, while the men saunter along with distaffs in their hands, or idle and smoke in the sun. To complete this rough sketch it should be remembered that they are seldom to be seen with the long broad-mouthed wicker basket on their shoulders, in which, or on which, all burthens are deposited, a basket merely differing slightly in shape and its larger dimensions from that used in the mountains of Switzerland.
Small brooch.
Worn by the small class of village women.

L.—CHAPLETS.

1. Chaplet.
Used by Brahmins only.
2, 3. Chaplets.
Used by Mahomedans.
4. Chaplet.
Worn by Hindoo men and women of the higher castes. The beads are used to count the prayers said.

M.—TOOLS.

1 to 44. Collection of tools.

N.—TOILET SET.

1. Cup for hair-oil.
2. Comb.
3. Looking-glass.
4. Soorma box.
Soorma being a black preparation used to darken the eyelids.

O.—LAMP.

1. Lamp.

P.—WEDDING ORNAMENTS.

2–6. Wedding ornaments.
In pure gold, always presented by the bridegroom to the bride. No. 2 is worn by Naick women only, No. 3 by Sudra women only, No. 4 by Roman Catholics, No. 5 by Protestants, No. 6 by low-caste Roman Catholics. Each ornament costs the large sum of 2*s.* 6*d.*
One pair of drawers.
One woman's boddice and skirt.

COLLECTION of ORNAMENTS worn by the different Classes and Tribes inhabiting the Chandah District in the Central Provinces.

Ear-rings.

142. "Talpa."
143–146. "Gundya."
149. "Pan Balya."
150. "Balya."
153. "Pirdhin Balya."
154 to 156. "Bugrya."
157. Kurka.

Nose ornaments.

26. "Mukhri."
27. "Mukhri."
28. "Moti Ratanpuri."
29. "Moti" (ordinary).

Necklaces.

168–171. "Sari."
172, 173. "Chintai."
174. "Argathi."
175–179. "Sakhli."
180. "Paihsara."
181–194. "Mal."
195–203. "Gathi."
204. "Nuirbone."
206. "Tik."
207–212. "Garooli."

Armlets.

59. "Ber."
60. "Dano wela."

Bracelets.

205, 207, 208, 211. "Kara."
206. "Dand wela."
210. "Kare."
209. "Kakhuya."
212. "Wela."
213, 214, 224, 228. "Mathya."
215, 218. "Wala."
216, 217, 219. "Mastwia."
222, 223. "Patli."
229. "Wali."
230, 232, 233. "Wel."
231. "Ber."
234. "Khaknya."
235. "Phura."

Finger-rings.

28, 29. "Mudya."
30. "Sikka."

Anklets.

89. "Wakya."

Toe-rings.

67–69. "Bichwe."
71. "Gorwi."

Lady Frere, London.

Silver pen-box. "Kalamdan."
Carbuncles (12).

Hon. R. Bourke, London.

Armour. Steel inlaid with gold.
Armlets (2 pairs). Steel inlaid with gold.
Cup. Silver and green enamel.
Cup. Silver-gilt, green and blue enamel.
Decanter. Silver gilt.
Decanters (2). Silver and green enamel.
Coffee-pots (2). Silver and green enamel.
Bowls (2). Silver and green enamel.
Basket with cover. Silver filagree work.

J. R. Royle, London.

Ostrich eggs (pair). Mounted in silver gilt.
Silver-gilt filagree boxes and stands (2).
Silver-gilt filagree boxes (2) with covers.
Chinese silver tankards (2).

H.H. The Maharajah of Jeypore.

"Ankus." Elephant driver's spear. Enamelled, and set with precious stones.

The enamelled work produced in the State of Jeypore is the finest in India, and is considered of great artistic merit. The enamel is very superior, and is only applied to gold and silver. The process of manufacture is kept a secret by the artizans, who regard it as an heirloom. All articles manufactured by them become the property of the State, which pays liberally for them.

SECTION II.—IRON AND STEEL WARES.

Madras Committee.

Bread knives (2), with ivory handles. From Arnachellam, Salem.

Bengal Committee.

Digging implements (3 varieties), "Roupurie," "Tangna," "Kodali," "Kurnick" (trowel). From Bancoorah, Sylhet, Chittagong, Howrah, and Calcutta.

Cutting tools. "Kural" (wood-cutter), "Kurali" (axe), "Katchta" (sickle), "Katari" or "dao" (for cutting jungle). From Sylhet, Chittagong, and Howrah.

Weeding tool. "Neran." From Howrah.

Sacrificial knives. "Kharra" or "Khanda" (used for the slaughter of buffaloes and large goats), "Katari" (a smaller knife used for sacrificing goats). From Ranaghat.

A knife. "Bonti" fixed upon a wooden stand "Batneh. Used for scraping and cutting fish, vegetables, &c. Ranaghat.

Betel-nut cutters. "Katyle," "Sarota," "Janti." From Sylhet, Alipore and Ranaghat.

Razor, "Khoor." From Sylhet.

Nail-cutter, "Narun." From Sylhet.

Crowbar, "Sabul." From Howrah.

"Kajálnata." From Calcutta.

A "Kajálnata" is an iron spoon-shaped instrument used in mixing and applying lamp-black to the eyes.

T. C. Nundon, Bhowanipore, near Calcutta.

"Dao." Jungle-cutting knife.
Knife. For pruning tea trees.

Messrs. T. E. Thomson and Co., Calcutta.

Knife. Used for tapping palm trees.
Jungle-cutting knives (2).
Fish spear.

Punjab Committee.

Pocket knife. From Gujran wálá.
Hunting knife, bone handle. From Gujran wálá.
Bread knives (2). Handle of green stone (plasma), From Shahpur.
Butter knives (2). Handle of green stone (plasma). From Shahpur.
Knives and forks (2). Handle of green stone (plasma). From Shahpur.
Scissors and knife combined. From Shahpur.

SECTION III.—ARMS, WITH THE EXCEPTION OF WAR ARMATURE.

Madras Committee.

Khond battle-axes (4). From Ganjam.
Hunting knives (3). Arnachellum Achary, Salem.
Boar spear-heads (3). Arnachellum Achary, Salem.
Coorg knives (3), with silver handles studded with gold, in sheath mounted with silver, and having a silver chain attached. From Mercara.
Coorg knife. With wooden handle, and cloth belt attached. Mercara.
Dagger. With gilt chased hilt, in green velvet sheath overlaid with gilt filagree work. From Kurnool.

H.H. The First Prince of Travancore.

Elastic brass sword. Travancore.
Dagger. Black coralline handle, silver mounted. From Travancore.

Ramung Marah, Tahsildar of Ernad, Malabar.

Mopla knives (2). Mounted (1) in silver, and (2) in brass. From Calicut.

H.H. The Rao of Kutch.

Sword. From Kutch.

H.H. The Guickwar of Baroda.

Suit of chain armour. Complete. From Baroda.

Bengal Committee.

Gun, double-barrelled. From Monghyr.
Pistols (5). Single and double-barrelled. From Monghyr.
Monghyr has long been known for manufactures of this kind, and has been in consequence styled the "Birmingham of India."
Brass pistol. From Boodbood subdivision, Burdwan district.
Swords (3). From Darjeeling, Sonthal Pergungahs and the Garrow Hills.
Garo Sabre and Shield. "Longhoree." From Gowalparah.
Sword-stick. "Goupthy." From Sylhet.
Shields (3). From Darjeeling and the Garrow Hills.
Wooden shield, mounted with iron spike and hook. From the Sonthal Pergunnahs.
Nepaulese knife. "Kukri."
Battle-axe, from Darjeeling.
Axe. "Ram dao." Used for sacrificial purposes. From Ranaghat.
Axes (6). From Sylhet, Chittagong, Turreedpore, and Cachar.
Spears (2). From the Garo Hills.
Spear-head. From Darjeeling.
Spear-head, "ballam," with steel ferule and spike for butt-end of the bamboo pole on which the spear-head is fitted when used. From Bancoorah.
Bows (3) and arrows. From the Sonthal Pergunnahs.
Arrows. From Darjeeling.

Babu Sridhur Sahi, Zemindar of Maujha, Sarum.

A dagger.

T. C. Nundon, Bhowanipore, near Calcutta.

Battle-axe. "Tangi."
Nepaulese knife. "Kukri."
"Dhoop."

Punjab Committee.

Weapons from Peshawar, as follows :—
Carbines (2). Peshawar.
Swords (2). Persia and Jeerah.
Dagger. Peshawar.
Dagger, Green stone handle.
Dagger, Buck handle.
Knives (4). Herat, Persia, and Boneyr.

Rangoon Local Committee.

Axe, used by the Karens.
Pellet bow, used by the Karens.
Cross-bow with quiver and arrow, used by the Karens.
Knives (2). "Dah." In ordinary use for wood-cutting.

Mysore Local Committee.

Weapons from Coorg, as follows :—
Coorg guns (2), matchlock and flint.
Coorg knives (2).
Coorg spears (2).
Coorg bow and arrows complete.
"Todanga," brass waist belt with chain, &c., complete.

Indore Local Committee.

Bow and arrows, used by Bheels.

Bhopawur Pal Agency.

Bow. "Kamptee." Made of bamboo.
Arrows. "Tir." Reeds tipped with iron.
Arrows. "Bitla." Reeds with hard wooden points.
Spear-head and pistol combined. "Bhalla."

SECTION IV.—OTHER KINDS OF METAL WARES.

Madras Committee.

Goglets (4), brass inlaid with pewter. Trichinopoly.

"Chemboos" (6). Drinking vessels. Chased brass. From Trichinopoly and Tirupatty.

"Chemboos" (3), brass inlaid with copper. Tirupatty.

"Panchapatras" (2). Drinking vessels, brass. Trichinopoly.

"Guindys" (5). Drinking vessels, bronze. Calicut.

Bombay Committee.

Specimens of *Bider* or *Bidri* ware (composition metal inlaid with silver). From Surat and Bombay.

Bidri work Hookas, with embroidered pipes.

Bidri work, cup and saucer.

Bidri work, basin and cover with dish.

Bidri work, box.

Bidri or Biddery work is a species of inlaid ware of excellent form and graceful pattern. It derives its name from Bider, a city situated about 60 miles to the N.W. of Hyderabad. The following is an outline of the manufacturing process:—A mould of the required object is formed from a mixture of clay or sifted laterite dust, and cowdung. From this a cast is obtained in an alloy consisting of one part of copper and four parts of pewter. On the smooth surface of the cast, a design is first traced (by hand), and afterwards deeply engraved by means of a small chisel and hammer. Thin plates of pure silver (or in the more durable kind of Bidri ware, silver wire) are then hammered into the depressions intended for them, and finally the surface of the vessel is smoothed, blackened, and polished.

Drinking vessels (42) of copper, brass, and tin. From Nassick and Bombay. "Palas," "Lotas," "Tambias," "Panchpatrees," and "Zarees."

Vessels for holding water (15), of copper and brass. From Nassick and Bombay. "Kulsees," "Handas," "Ghagurs," "Sooryees," "Porias," "Gungals," and "Khujas."

Vessels for cooking and other domestic purposes (38), of copper and brass. From Bombay. "Gunj," "Tupala," "Halwan," "Buck dee" (frying pan), "Kaduyee" (frying pan), "Karunda," "Chalum," "Tuvie" (pot cover), "Pulee," "Moodalee" (spoon), "Dowla" (spoon), "Purathe" (spoon).

Plates and dishes (10). Copper and brass. From Bombay.

Lamps (11) and oil pots (3). Brass. Bombay.

Tea-pot, coffee-pot, and milk-pot. Copper. Bombay.

Hooka, tin. Bombay.

Spittoons (2), copper. Bombay.

Fire stands (2), copper. "Dhoop," "Dhaum," and "Augdan." From Bombay.

Bengal Committee.

Drinking vessels (5). From Hugli and Burdwan.

"Gelas." Drinking cup with lid.

"Chakee." Drinking cup with lid and tray.

"Bati." A brass cup (10 varieties).

Vessels for holding or carrying water (5). From Hugli and Burdwan.

"Ghada" or "Ghara." Brass vessel for carrying water.

"Garu." Brass water-pot with spout.

"Badna." Copper water-pot with spout.

"Dhothaki Ghurra." Brass water-pot.

"Mitah Ghurra." Brass water-pot.

Cooking utensils. Brass. From Hugli and Burdwan.

"Ghati" (9 varieties), "Dabor," "Bahugna" (3), "Tusla," "Batule," "Deck," "Chatu hari," "Taulah hari," and Chatoo (iron baking platter).

Brass trays. From Hugli and Burdwan.

"Thala" (3 varieties), "Shalbot," "Rikabi" (for holding flowers), "Bogi thala." "Parat."

Other domestic utensils. From Hugli and Burdwan.

"Tel bhand" (an oil pot), "Dhaknee" (a brass cover), "Chillamchi" (2 in No. , brass washing bowls), "Mechla" (a brass bowl), "Gamla" (brass washing bowl), "Hattas" (brass and iron ladles), "Jhangri" (an iron strainer), "Khuntee" (an iron spatula for stirring), "Hat Kuruni" (a scraper), "Bonti" (a scraper and cutter), "Kuruni" (a scraper), "Beri" (a pair of tongs), "Pala" (an iron ladle), "Tala" (a brass padlock), "Taulah Jhanjrah" (a sieve or wash-pot), "Thálá" (a platter), "Tástooree" (a platter), "Jhinuk" (a canoe-shaped metal feeding spoon. "Jhinuk" is the native name for the bivalve *Unio marginalis* of Lamarck, common in the tanks of Bengal).

Implements connected with the use of narcotics:—

"Gurguri." Metal huka with snake attached. Hugli.

"Baitak." Bell-metal huka-stand. Hugli.

"Batta." A spice and betel-leaf box. Hugli.

"Janti" (2). Betel-nut cutters. Brass. From Burdwan and Kishoregunge.

"Depa." A receptacle for prepared betel.

Brass pán box (receptacle for prepared betel). From Howrah.

Kooki woman's tobacco pipe, with receptacle and filter for tobacco juice.

The reservoir below the bowl is partly filled with water, into which the tobacco juice falls. When full the reservoir is emptied into the filter, which is stuck into the ground at the sharp end.

The Kookis keep tobacco juice in leaden or silver vessels; when required for use a small quantity is taken into the mouth, and after being kept there for some time is spat out again.

Common Kooki pipe.

"The Kookis are great tobacco smokers, and "have the same eccentric fancy for the oil of "tobacco that is a distinguishing feature of "the Angami Nagas," who "collect the tobacco "oil that is precipitated in the bowl of the pipe, "and drink it mixed with water."—*Col. Dalton.*

Bidri work. From Purneah.

"Bidri" (from *Bider*, in the Deccan, where this art-industry is said to have been first practised in India) is the name given at Purneah to a composite metal, the chief component of which is zinc. With this is mixed, in small quantities, copper and lead. Roughly the proportion may be given thus:—In every 13 oz. of the compound metal rather more than 12 oz. would be zinc; rather more than ½ an ounce would be copper, and less than ½ oz. would be lead. Upon vessels and other articles, made in this composite metal, patterns are traced and cut out in shallow intaglios by chisels of various shapes, and the hollows so formed are filled with thin silver plates which are made to adhere firmly to the bidri ground by the use of hammer and punch. The work then receives a polish by friction, first with cakes composed of lac and powdered corundum, and finally with charcoal; after this the ground or bidri metal receives a permanent black colour by being rubbed with a paste of which the chief ingredients are sal-ammoniac and nitre. This blackening of the bidri ground not only heightens the effect of the silver inlay, but prevents the tarnish which otherwise would in time disfigure the ground The industry is of Mahomedan introduction, and Purneah has long been celebrated for it.—See *Buchanan Hamilton*.

Hookah-bowl with fittings ("Naicha," &c.). "Bidri" work.

"Abkora" (water vessel), with "surposh" (cover) and "tastari" (salver). Bidri work.

Weaver's shuttle. Brass. Burdwan.

Pair of scales. Brass. Burdwan.

"Khora." Metal utensils used by Garo tribes. From Gowalpara.

Sitaram Rana of Chandrakona, Midnapore District.

Brass figure of Radhika, consort of Krishna.

Chandrakona is well known for its brass manufactures, chiefly utensils.

Nafar Rai and Haradhan Gharni of Kharar, Midnapore District.

A "thala." A large circular brass tray, 21 in. in diameter. From Kharar.

Kharar is well known almost throughout Bengal for the manufacture of such articles; but the specimen sent, though the best procurable at the time, is not quite equal to what these makers can produce.

N.W. Provinces Local Committee.

Water pots (26). From Benares.

Plates (16). From Benares.

Spittoons (2), mug and basin. From Benares.

"Cholee" (2). A standard used by natives as a mark of respectability.

"Pandan" (2). A box for "pan" (leaves of Chavica betel), an aromatic herb eaten after meals.

Images (21) of Hindoo gods. From Benares.

H.H. the Maharajah of Benares.

Collection of native drinking vessels (36).

Rangoon Local Committee.

Triangular gong and stick.

Hyderabad Local Committee.

Articles of Bedree ware, manufactured at Beedur, a district of H.H. the Nizam's territory:—

Trays and boxes (7), "Pandan," "Dubba," &c., with compartments for keeping betel-nuts and spice.

Hookah-bowls (9).

Spittoons (3). "Oogaldan."

Cup and saucer with cover.

Drinking vessel. "Abkora."

Vide Notes on the articles of *Bidri-ware* exhibited by the Bombay and Bengal Committees.

Mysore Local Committee.

Drinking cup. From Coorg.

India Museum, London.

Brass "Chombu" (drinking vessel). From Madras. From London Exhibition of 1872.

Opium pipe and tobacco box. From London Exhibition of 1872.

Tea-pot. From London Exhibition of 1872.

GROUP VIII.—WOOD INDUSTRY.

SECTION I.—CARPENTERS' AND CABINET WORK; VENEERS CUT, TURNED, CHISEL, AND CARVED WORK.

Note on Inlaid Work.

This work, according to Framjee Heerjeebhoy and other craftsmen of the trade, was imported into Bombay from Persia through Scinde, and it seems from inquiries made by Dr. Birdwood on a previous occasion, that they all agree in naming Shiraz as the place from which it emanated. Three Mooltanees, Devidas and Vulleeram, brothers, and Pershotum Heeralal, were the first, it would seem, who settled about a hundred years ago in Scinde, where Kuntaree or Soortee people acquired the art under them, and came to Bombay about sixty years ago, from whence they spread to Surat, Baroda, and other places. The trade now is merely imitative, new geometrical combinations are seldom thought of, the workers content themselves with simply copying the forms which were imported from Persia. Manoredas, Nundlal, Lalchund, Thawurdas, Ruttonjee, Pranvulubh, and Narrondas are said to have been the first who introduced the work into Bombay. A number of Parsees and Soortees have since been educated by them. Dr. Birdwood gives a list of fifty shops now carrying on the business in Bombay, giving employment to about a hundred and twenty people.

This work is composed of the following materials:—Ivory, which is always white; Samber Horn (Sawursing) which is always green; the colour is produced by steeping it in verdigris dissolved in lemon juice, toddy, or vinegar.

Sandal-wood used in its natural colour.

Ebony, on account of its colour.

Pattung—Sappan-wood—according to Dr. Birdwood "the wood of Cæsalpinia Sappan." This wood is of a rich burnt sienna colour, and seems to have been unknown to the Persian workers, as vermilion is substituted for it.

Mineral—Tin (the Persians use brass instead), in imitation of silver. This is generally purchased round, and passed through a roller known by the name of Rāt, the lower wheel of which is cut in several places, forming more or less acute angles, the upper wheel being smooth; the tin issues from it in a triangular shape. This and all the other materials partake of the shape of the square, the rhombus, the isosceles equilateral and right angle triangles. Segmental forms are sometimes given to the ivory, sandal-wood, and ebony filling in ground, so as to admit of circular designs. The tin employed is sometimes round, when used as a border, and is then known as "Ekdani," which means one line, and forms a succession of round dots. The sandal-wood is never introduced in borders, but is employed in the larger patterns; the materials are glued together into various geometrical forms, consisting of circles, hexagons, the square, the rhombus, and the triangle; the glue usually used in preference to all others is Ahmedabad glue, which is considered by native workers stronger than any manufactured in the country or imported from Europe. It is dissolved in brandy or spirits of wine. The length of the pieces glued together is generally two feet, and these are sawn off in sections with delicate saws in widths varying between the 15th and 20th part of an inch. These are glued on to sandal-wood about a quarter of an inch thick, the latter is fastened on to black-wood (Sissoo), teak-wood (Saag), or deal (Deodar). Not unfrequently the whole box is made of Sandal-wood, but this adds materially to the expense. Some of the designs are known under the names of—

Mhotee Kutkee-no-gool—A design of comparatively large hexagons. The prefix Kutkee is applied to the work when sandal-wood and ebony are introduced.

Adhee Dhar-no-gool—The rhombus.

Tun Dhar-no-gool—The triangle.

Chorus-gool—The square or matting pattern.

Gool—Round.

Poro Hansio, Jafran Marapeck, Sankro Hansio, Lehero, Jeri, Ekdani, and Baelmootana are names applied to borders.

A cheap white wood known as "Dooblo" has been tried as a substitute for ivory, but its use has been discontinued, as it does not answer; it is however still used in the Ceylon inlaid woodwork.

Madras Committee.

Rosewood box. Inlaid with other woods. From Mysore.

Book slide, paper weight, and paper cutter. Ivory and sandal-wood. From Vizagapatam.

Necklaces (2). Sandal-wood beads. From Madras.

Glove boxes (3). Carved sandal-wood. From Canara.

Card-cases (2), and book covers (1 pair). Carved sandal-wood. From Shemoga, Mysore.

Pith models of temples (2). From Trichinopoly.

Shola pith figures (6). From the pith of Æschynomene aspera. From Tanjore.

Messrs. Deschamps and Co., Madras.

Inlaid table top. Showing the various woods used in cabinetwork in Madras.

Sevaramiah. Carved cocoa-nut, mounted on silver. From Ganjam.

Major Buckle, R.A., Madras.

Writing paper case, made of an elephant's foot.

Bombay Committee.

Collection of ivory inlaid work, consisting of:—
Card cases. Card trays.
Paper-cutters. Paper weights.
Money boxes, glove boxes, and wafer boxes.

Portfolios, Envelope cases.
Bookstands, needle cases, &c.
Made by Messrs. Jemshetjee Shapoorjee, Bowanyshunker Hurryvalabh, Framjee Heerjebhoy, Framjee Heerjee, Rustomjee Merwanjee, Framjee Pestonjee, Cavusjee Munchurjee, Rustomjee Munchurjee, and Jemshetjee Heerjee.

Collection of carved and inlaid work in sandalwood and ebony, consisting of:—
Work boxes, glove boxes, money boxes.
Handkerchief boxes, stamp boxes, &c.
Needle cases, envelope cases.
Card cases, card trays, card boxes.
Paper cutters, paper weights, bookstands, &c.
Made by Messrs. Jemshetjee Shapoorjee, Framjee Pestonjee, Framjee Heerjee, Damodhus Maneck, Bowanyshunker Hurryvalubh, Jemshetjee Heerjee, Kalidass Nursi, Bowany Purshotum, and Cavusjee Munchurjee.

Jemshetjee Shapoorjee, Bombay.

Inlaid work in ivory, sandal wood, and bison horn (95 specimens.)
Cabinets, writing desks, inkstands.
Album covers, cribbage and chess boards, card cases, &c.
Carved sandalwood and ebony work (140 specimens).
Cabinets, jewel boxes, writing desks.
Glove and handkerchief boxes, album covers,
Work-boxes, caskets, card cases and trays, &c.

Framjee Heerjeebhoy, Bombay.

Ivory inlaid inkstands, portfolios, cribbage boards. pocket books, watch cases, &c. (50 specimens.)
Carved sandalwood and ebony work, (100 specimens).
Sandalwood and ebony workboxes, portfolios.
Album covers and glove boxes, adorned with Delhi pictures.
Pocket books, paper cutters, watch stands, and other fancy articles.

Cavusjee Munchurjee, Bombay.

Inlaid and carved work in ivory, sandalwood, bison horn, and stag horn. Fancy articles similar to those sent by preceding exhibitors.

Bowanyshunker Hurryvalubh, Bombay.

Collection of ivory inlaid articles (52 specimens).
Collection of sandalwood and ebony carved articles (51 specimens). Bombay, Coompta, and Surat work.

Framjee Pestonjee, Bombay.

Ivory, inlaid, and carved sandalwood and ebony work (183 specimens), consisting of desks, workboxes, jewel boxes, &c.

Rustomjee Cavusjee, Bombay.

Ivory, inlaid, and carved sandalwood, ebony, and ivory articles (similar to those of preceding exhibitors), 84 specimens.

Bowany Purshotum, Bombay.

Ivory, inlaid, and carved sandalwood and ebony articles (similar to those of preceding exhibitors), 63 specimens.

Framjee Heerjee, Bombay.

Ivory inlaid solitaire board with balls.
Ivory inlaid "Fox and Geese" game.

Bengal Committee.

Collection of fancy articles of ebony inlaid with ivory. Fram Monghyr. (9 specimens.) The collection consists of cabinet, envelope and paper cases, desks, workboxes, cribbage board, and ruler.
Collection of carved wood, personal ornaments (21 specimens). From Monghyr.
Necklace and bracelets of betel-nut wood (Areca).
Girdle, necklaces, bracelet, brooch and earrings of tal-tree wood (Palm).
Necklaces, bracelets, earrings, and brooches of ebony.
Set of (12) knitting and crochet needles. From Monghyr.

N.W. Provinces Local Committee.

Chairs (2). Barailly workmanship.
Jewel boxes (2). Barailly workmanship.
Bread plate and book easels. Carved wood. From Saharunpore.
Carved board. From Etawah.
Pair of sandals with wire workmanship. From Mineepooree.
Watch case. From Mineepooree.

Dr. Leitner, Lahore.

A Bombay sandal wood box and cigar case.

Mysore Local Committee.

Carved sandal wood "chowries." Used in Hindoo temples.

Bhopawur Pul Agency.

Teak wood plate ("katol") and spoon ("chatwa"). Used in culinary operations.

Col. Michael, London.

Stamp box. Inlaid ivory and ebony.

A. McWebster, London.

Carved box. In sandalwood.
Photograph album. Sandalwood covers.

SECTION II.—PRODUCTIONS OF CLEFT-WOODWORK; CORK MANUFACTURES, AND BASKET WICKERWORK.

Bengal Committee.

Table mats (3 sets). Each set contains 36 mats. From Monghyr.
Baskets (7). Round, oval, and square, coloured and plain. Monghyr.
Hand punkahs or fans (9). Of various shapes.

Rangoon Local Committee.

Burmese boxes (11). Various qualities and sizes.

Indore Local Committee.

Basket with ornaments. Made and used by Bheels.

SECTION III.—COLOURED, PAINTED, STAINED, AND GILDED WOODWORK.

Bengal Committee.

Necklaces (2). Lacquered wood. From Monghyr.
Bracelets, broach, and earrings. Coloured wood. From Monghyr.

N.W. Provinces Local Committee.

Croquet sets (3). From Benares.
Candlesticks (2 pairs). From Benares.
Toys, swings, &c., &c. From Benares.

Lala Hurmak Rai, Hushyarpur.

Fancy articles, boxes, &c. turned in *shisham* (Dalbergia) wood and lacquered in various colours.

The following is an outline of the process:—The object to be lacquered is turned from hard wood, usually *shisham* or box. After being smoothed and cleaned it is again fixed in the turners' frame (a kind of lathe worked by hand), and made to rotate. The sticks of lacquer colour ("batti") consisting of a mixture of lac, resin, colouring matter, and, it is said, a certain proportion of sulphur and bees'-wax, are then applied to the rotating object; the heat produced by friction is sufficient to soften the lacquer composition, which attaches itself to the wood, producing, however, a dull and streaky appearance. When sufficient colour has been applied, the surface of the article is skilfully rubbed with a piece of bamboo having a fine edge, by which the colour is evenly distributed, and a polish produced, which is finally completed with oiled rags.

To produce the mottled appearance so much admired, a colour stick of a rather harder composition than that used for producing a uniform colour is lightly pressed against the rotating object, so as to detach a point here and there. This is repeated with sticks of different colours, and when sufficient colour has been laid on, the object is polished with bamboo edges and oiled rags, as stated in the preceding paragraph.

(Abstracted from Baden Powells' Manufactures.)

Dr. Leitner, Lahore.

Two Sind lacquered wooden boxes.
Kashmîri painted wooden box.
Several specimens of Pakpatan woodwork (Panjab). This kind of work is fully represented elsewhere in the section. The Sind work, if coarse in colouring, makes attempts at the delineation of figures, which the Pakpatan and Hushyarpur work of the Panjab does not.

Government of Bombay.

Lacquered boxes. Single and in nests.
Lacquered Bezique box, box with set of squaills, &c.
Lacquered crocquet set and humming tops.
Lacquered napkin rings and card trays.
Lacquered rulers and map cases (nest of 5).
Lacquered flower vase, with nest of boxes (5) in centre; on pedestal. (Two in number).
} By Mahomed Jaffur Butcha, of Haidarabad, Sind.

Gold lacquered boxes (2 nests of 8 each). By Kurrumchund Moorjmull, Haidarabad, Sind.

Lady Frere, London.

Lacquered map case.

Col. Michael, London.

Lacquered Burmese box.
Lacquered tray. From Kurnool.

GROUP IX.—STONE, EARTHENWARE, AND GLASS INDUSTRY.

SECTION I.—STONE AND CEMENT WARES.

NOTE on the STONE INDUSTRIES of AGRA. By H. G. Keene, Fellow of the University of Calcutta, Author of the Moghul Empire, The Agra Guide, &c.

Agra, with the neighbouring country from Gwalior round by Jaipoor to Delhi, has long been the seat of several very beautiful arts, which may be thus classified:—

1. *Munubbut-karee.*—The art of inlaying [part, pass II, of *nubt*, an Arabic word signifying "to plant," "to cause to germinate"].*
2. *Jalee.*—Pierced screen work in marble or sandstone.
3. *Soap-stone* carving.—A new art.

Before describing each of these in detail it will be as well to give a brief sketch of the history of architecture, as it exists in this tract of country, as the mother art to which the decorative arts are in the main subsidiary.* The practice of uniting soap-

* SO SHAKESPEAR. The *Ghaias-ool Loghat* and other Asiatic authorities regard the word as referring to things *raised* from the ground, like plants; it would thus imply *rilievo*, such as the images on friezes, cameos, or coins. The Hindoo word is *puchchi-kari*, "adhesive work," perhaps a corruption of *pur chunkuri*, the Persian term.

* DATES OF HINDOOSTANEE ARCHITECTURE.

	DATE, A.D.
Foundation of 1st Pathan School under Kootub-ood-Deen Aibuk, about	1200
[Principal specimen *Tomb of Altumsh*	1235]
Second School or period of Toghluk Shah	1320
[P.S. *Tomb of T. S.*; Roof in a flat dome slightly pointed expressive of their arch, about the same date.]	
Third Pathan period, S. Shah [P.S. *Killa Kona Musque*]	1540
Commencement of Moghul School (under Akber)	1556
P. S. Fort *at Agra*, from 1566 to about	1630
Turning point of Moghul architecture when Hindoo work was eliminated by Shah Jahan	1640
Earliest Colouring, about 1540 / Inlaying of Itmad-ood-Dowlah 1620 / Khas Muhul of Agra 1630-7 } Completion of Jam'a Musjid at Agra, 1639	1644
Taj Muhul 1630-1648 } to Taj Compt.	1648

stone carving with architecture has not yet been attempted; though it is very suitable for the decoration of the interior of small buildings at least; and its introduction some time or other is not unlikely. But the other two industries are primarily and essentially architectural; and any specimens utilised for another purpose must only be regarded in the light of samples.

The origin of the eclectic school of architecture prevalent to this day in Upper India is to be found in the adaptation of the old Pathan ideas to the habits of Hindoo workmen. Like English Gothic, Hindoostanee architecture has had five periods; although, unlike English Gothic, it is still a living art. And the five periods are chiefly marked out one from the other by the presence or absence of the influence of the unoriginative but patient craftsmen of alien blood and pagan creed, who lent their cheap yet precious labour to the works of their Moslem masters, and who are still working out the problems suggested by that most fortunate combination.

1st Period.—The foundation of the School of which I am speaking may be assigned to the *Ghori* conquerors, the first fine product of the eclectic architecture of Hindoostan being the tomb of Altumsh at old Dehli. This monument, built about A.D. 1235, stands at the N.W. corner of the Great Mosque attached to the Kootub Minar, and is considered by Mr. Fergusson (II. 651) to be one of the richest examples of Hindoo art applied to Mohammedan purposes that Dehli has to show. He adds, however, that the builders still display a certain degree of inaptness in fitting the details to their new uses. It has no roof; and it may be doubted if it was ever intended to have one.* The walls are seven feet in thickness; and the interior forms a square of over twenty-nine feet, the panels of which are beautifully decorated. The same authority speaks of this period as remarkable rather for a stern severity of style and gloomy appropriateness than for the lighter graces of architectural design.

2nd Period.—After lasting about a century this style gave way to the second period, that of increased gloom and hardness; and the rude grandeur spoken of by Fergusson at page 653. Specimens of this are to be found in the tomb of Toghluk Shah (outside the S. wall of the ruined city of Toghlukabad, some ten miles S. of modern Dehli, or Shah Jahanabad) and the *Kalu* or *Kulan Musjid* (near the Toorkman gate of the modern city). These buildings are in fine taste; and though severely simple do not entirely disdain the use of colour. In the tomb of Toghluk particularly, good use is made of "bands and borders "of white marble on the large sloping surface of red "stone. The horse-shoe arches are of white marble, "and a broad band of the same goes completely "round the building at the springing of the arches. "Another broad band of white marble, in upright "slabs four feet in height, goes all round the dome "just above its springing."—(*Cunningham.*) The mosque is believed by the same eminent authority to have been entirely covered with a coating of coloured plaster, most of which has now fallen off.

3rd Period.—It is the period beginning with the short *Sur* dynasty in 1540 that we find colour first introduced, generally and boldly. The system of encaustic tiling had been introduced about the end of the thirteenth century in Persia, where the ruined Mosque of Tabreez is said still to glow with a most elaborate play of pattern and of hue. The first fine specimen of this art in Upper India seems to be the *Killa Kona* Mosque in the *Poorana Killa*, which was the citadel of Sher Shah's city, just outside the "Dehli Gate," of the modern town. This building exemplifies the words in which Fergusson describes this brief but splendid period:—

"The façades .... became more ornamental, and more frequently encrusted with marbles, and always adorned with sculpture of a rich and beautiful character; the angles of the building relieved by little kiosques .... but never with minarets which, so far as I know, were not attached to Mosques during the Pathan period" (p. 655). Coloured tiles were now freely employed; and the style is altogether remarkable as the natural precursor of the existing school.

4th Period.—The Moghul School of Hindoostanee architecture, the basis of modern practice, arose under Akber, the celebrated grandson of the Conqueror Baber, in the time of whose incapable son the brief dynasty and school above referred to had flourished. The new school differs from its predecessor in two things chiefly:—

1. The employment of Hindoo treatment, which had been accidental, capricious, and fluctuating, was undertaken on a declared system of eclecticism and amalgamation.

2. The effects of colour were much bolder than heretofore, and variegated marbles were generally used in place of encaustic tinting.

As long as the Musulman adventurers maintained a close connexion with Central Asia, India was no more to them than England to the Dukes of Normandy in the 11th and 12th centuries. Baber was buried at Cabool; and it was in that country and in Persia that his wandering son naturally sought repose when Sher Shah was too strong for him at Agra and Dehli. But in the course of these wanderings Humayun become the father of the great Akber. He saw from the first, young as he was on his accession, that to make his position permanent he must root it in the soil. Cutting off, therefore, all communication with the ancient seats of his dynasty, and sternly suppressing the individuality of the immigrant nobles, he set on foot a complete amalgamation, social and political. He took a wife from the purest Rajpoot blood; he created a batch of Hindoo grandees or peers; he endeavoured to abolish all that was most exclusive in the creed of Islam; and he raised the people of the whole country from the condition of tribute-paying Helots to that of an emancipated and protected community.

It was under such influences that the architecture of Hindoostan entered upon its most famous epoch, and its most brilliant productiveness. Retaining all that was graceful and bright in the architecture of the later Pathans, the Moghuls at first deferred in details entirely to the habits of the Hindoo workmen whom they not only employed as agents but accepted as associates. The result was most successful. In many of the buildings so constructed the principles that had spread from Byzantium to the East were freely adopted; the vaulted roof, the lofty arch with true voussoirs and key-stone, were often necessitated; but there are edifices of this period, neither rare nor unimportant, where the arch and cupola are rigidly excluded, and where nothing remains to remind the

* General Cunningham considers it was certainly roofed "with an overlapping Hindoo dome."

beholder of Central Asia but the slender column and the rare kiosque.

Chief among the works of this time (in order of date) are:—

	A.D.
The Fort at Agra from - -	1566
The Palace at Futtehpoor Seekree, from about - - -	1570 to about 1600
The tomb of Akber at Sikandra, -	1608–1613
The tomb of Itmad-ood-Dowlah -	1621

to which may be added the group of tombs at Lahore of some five years later than the last-mentioned date. (These were once decorated both with tiles and inlaying, but the Sikhs have injured both, and especially the latter.)

Between the works of Akber and those of his son and immediate successor Jahangeer, will be found little generic difference; and wherever inscriptions and contemporaneous writings are wanting it is hard to determine from internal evidence to which reign a work belongs. The absence of the use of timber, the fine stone-chiselling, and the sparing employment of the true arch, mark both alike. Under Shah Jahan, however, these things disappear, while a new element comes into prominence.

5th Period.—At the end of 1627 Shah Jahan succeeded his father Jahangeer, and at once began the most splendid series of buildings that modern times have seen. The Indian Saracenic school of Shah Jahan is seen to have modified the preceding eclecticism and to have adopted a softness of contour and a use of dazzling detail which trembles on the line that separates pretention from true dignity; and though its happiest efforts are unique in their charm, yet all its virtues lean to vice's side, and a fall is felt to be impending. Persian ideas predominate though Hindoo practice is not at first entirely eliminated from the details. It is only as the healthy industrious influence fades that the inherent faults of this last development of Moghul art become fully conspicuous, the stiff proportions, the effeminate curves, the want of true structural representation.

To give a catalogue of the works of this school would be to name all the buildings (excepting the Kootub Minar) which have made Indian Musulman architecture best known in Europe. The dates of some of the principal examples follow:—

The *Khas Muhul*, or private apartments of Agra Fort begin about 1628,	completed -	1637
The Deewan Khas of	do. -	do.
The Jam'a Musjid of 1628,	do. -	1644
The Taj Muhul of	do. do. -	1648
The Motee Musjid of	do. -	1653
The Jam'a Musjid at Dehli	do. -	1658

From the accession of Shah Jahan to his deposition by Aurungzeb is a period of thirty years, during which Moghul art culminated and commenced its decline. The same thing that occurred in politics occurred in art also. The Hindoo practice, divorced for a time from activity, languished in suspense, but it was the active partner that was doomed to die. While the Moghul architects have sunk from the Taj to the tomb of Sufdur Jung, and from the palaces of Shah Jahan to the stucco nightmares of Lucknow, the Hindoo has caught up and retained all that was best in the art of his employers, and has blended it with a vitality and an ingenuity all his own. Jaipoor and Muthra attest his excellence in carving, and the ateliers of Nuthoo and Purusram of Agra equal if they do not surpass the finished *pietra dura* of the inlayers of the Taj. These industries are extant at this day in this small tract of country in complete perfection, and give it the honourable distinction of harbouring two arts that are unique among the arts of the world. As there is no civilized country that can at the present day compete with India in the buildings that it contains, so none can contend with the people of this part of India in the eye for colour or the hand for elaborate workmanship. The traveller of to-day, going through northern Rajpootana and the land of Brij, finds galleries being placed in front of modern dwellings that need not shrink from comparison with the *loggie* of the Grand Canal. The workshops of Agra continue to turn out samples of inlaying that rival in taste and finish the famous ornamentation of the Medicean chapel. And these things are produced, not by proud and intellectual aristocracies in the hour of their greatest strength and grandeur, but by a patient subject race, not consulted in its own taxation or law-making, and enslaved to many degrading superstitions. In natural and political science England has a lesson for the East. In art the people of this country is the master of its conquerors, as of old. But the successors of the Moghul cannot contribute beneficially as their predecessors did. Yet the Hindoo mind is so docile and receptive that there is a danger of their arts being corrupted by intercourse with those from whom they are learning lessons in the practical sciences and their application. The vulgar maxim that "Time is "Money," and the vain craving for obvious utility, are spoiling art in England, and if not jealously guarded against will spoil it here.

Admitting that what has here been called *Munubbut* was originally applied to geometric patterns only, it seems almost to have deserted them now if you are to judge by the Agra workshops. The difference between the older, or *Taj*, work and that which seems now to be coming into vogue is that the former is symmetrical and has a certain amount of stiffness in consequence, while the latter strives rather to follow the natural forms and irregular dispositions of flowers, butter-flies, and birds. Except in minuteness of finish, I see no difference between the modern work and the flat *pietra dura* of Florence. This is a sad result of European interference.

Mosaic work appears to have had its origin in the East, the land of leisure and luxury; and to have passed over to the Roman Empire in the times of its Eastern conquests, only to travel back to its native home in later times.

The first mention of inlaying as applied to architecture occurs in the Bible. In the book of Esther the palace at Susa, now a mass of almost indistinguishable decay, is described as having "a pavement "of red, and blue, and white, and black marble." Borrowed by the Romans the art became what is now known by the distinctive name of "Mosaic;" that is, "the art of producing artistic designs by "setting small squares of stone or glass of different "colours, so as to give the effect of painting;" and continued to be a purely Italian art which it is necessary to distinguish from the architectural practice which forms our present subject. The etymology of the word "Mosaic" is unknown, so that it might equally appropriately be used of either branch of the inlayer's art. But, inasmuch as the

word has already its well-defined and well-known application, while Hindoostanee inlaying is properly architectural rather than pictorial, and is not produced by tesselation but by the insertion of large masses of jewel into blocks of white marble so as to form geometrical patterns rather than pictorial designs, it is well to leave the term as we find it. I propose to call Indian inlaying by the name of "Indian *pietra dura*."

This form of the art is peculiar to modern India, and in India to the particular region with which this paper is concerned. Besides the use of enamelled tiles, the Indian Mahometans adopted early the application of coloured stones, gradually elaborated from the simple courses of Toghluk's tomb to the minute decoration now in vogue. The art in its best condition is commended by Fergusson as "the "great characteristic of Moghul architecture after the "death of Akber." As to who introduced it authentic history is silent. It first appearance may perhaps be cited in the gate of Akber's tomb at Sikandra. Twenty years later it appears, still in coarse and purely arabesque patterns, on the tomb of Itmad-ood-Dowlah. Tradition says that its first development in the time of Shah Jahan was due to Persian artists; and this synchronizes with the arrival at that monarch's court of the distinguished amateur Ali Murdan Khan, the designer of the Dehli Palace and of the canal that supplied it with water. Up to this time the geometric traceries of the early inlayings are seen timidly borrowing a few floral forms—witness Shah Jahan's Palace in the Agra Fort. Immediately after, however, appears the full introduction of flower-work in the screen that surrounds the tombs in the Taj Muhul; and the vexed question arises, How was this revolution accomplished, and by whom? In the ten years that elapsed between the Fort buildings and the work at the Taj what influence had introduced an attempt at realization of leaves, stalks, and petals which, if not happily arrested, would perhaps have degenerated into a mongrel and rococo style?

I think it probable that the traditional belief, that European taste is here answerable, is not wholly unfounded. The Taj was designed by Eesa Effendi, a Constantinople Turk, and the Palace at Dehli decorated by Austin de Bordeaux, an accomplished French adventurer. That Byzantium was the home of true Mosaic is well-known, and the kindred art had been in vogue for about eighty years previous in Northern Italy, with which Austin was doubtless acquainted.* It is thus described in Sir D. Brewster's Encyclopædia:—

"Analogous to Mosaic is the *pietra dura* of Flo-"rence, which consists of irregular portions of hard "stones, containing the gradation of colours in each, "instead of obtaining that gradation by the union of "multiplied fragments." This, it may be observed, is an almost exact definition (as far as it goes) of the modern Indian *pietra dura* as seen in the screen of the Taj and its reproductions of to-day. And the three and a half flowers still pointed out by the curators as the work of the "master's" own hand have effects of shadow and of reversed leaf-ends in this style which exceed the limits of the pure conventional.*

However originated, this work is now practised chiefly by Hindoos. A few Musulmans at the Taj maintain an unsuccessful rivalry with the more painstaking workmen of indigenous blood; but they have never—as far as I am aware—exhibited, while the two Hindoo artists already mentioned have been honourably noticed and rewarded with medals, both in Indian and European exhibitions.

The practice of their art is very simple. The master-workman traces with delicate exactness a pencil outline of the design to be produced upon a slab of the whitest Jaipoor marble. The slab is then handed over to one craftsman, and a collection of jewels to another. The chief jewels used are Agate, Cornelian, Jasper, Blood-stone, Lapis Lazuli, and Turquoise. Each piece has its bed prepared on the master's tracing on the surface of the slab, while it is shaped by the associated workman. As each piece is ready it is handed to the inlayer, who fits it into its place with a cement of white lime. It is then covered with a small piece of glass, over which is laid a fragment of burning charcoal. When the annealing process is complete the glass is removed; and, when the whole design has been inlaid in this manner, the surface is rubbed over with a polishing powder and the work is ready. When the cutter and the inlayer have done their respective offices with due skill, no trace of the annealing is perceptible. In second-class work a small rim of cement may always be detected by its greater whiteness, separating the precious stone—whatever it be—from the bed of marble.

As to the uses of this art it has been already shown that it is essentially architectural. The jambs of great portals in a Moghul tomb, the pillars of a Palace-hall, should have their borders of bold arabesque. The panels of the interior admit of the more delicate floral tracery of the later school. But this, the original and legitimate application of the art, is in abeyance. Europeans are too unsettled and the wealthy natives too negligent to allow of their dwellings being beautified by this costly method. The patient workmen therefore have turned their attention to making smaller specimens of their art, which is now chiefly confined to tables, inkstands, trays, plates, and paper-weights. The time required to mature even these comparatively unimportant works is still considerable, and the prices commanded are not small. An average table will take two men from six to twelve months to complete; and when the value of the materials is taken into consideration, will not perhaps appear too expensive at a cost of from 30*l.* to 100*l.*, according, of course, to the amount of labour and material.†

The other characteristic stone industry of Agra and its neighbourhood is called *Jalee*. On the carved tracery of this part of India Mr. Fergusson only remarks:—

"There are some exquisite specimens of tracery "in marble at Agra and Dehli, but none quite equal

* There was formerly a good deal of work attributed to Austin at Dehli, including *pietra* pictures of birds, beasts, and his own likeness in the character of a long-haired Orpheus playing on the violin. Fortunately the dignity of the Taj was not compromised by any such realistic efforts.

* It is to be observed that, though Bernier does not notice the inlaid work at Dehli he particularly compares that of the Taj to the *pietra* of the Medicean Chapel. "You see such sort of "stones as are employed to enrich the chapel of the Great Duke "of Florence." But he does not notice the floral screen. Is it possible that this and the work at Dehli were added, after his visit to Aurungzeb?

† The mural *pietra dura* of the palace of Shah Jahan in Agra Fort is also being restored by these men at the charge and under the orders of the British Government.

" to this (of Ahmedabad in the Deccan)." This, however, *pace tanti viri*, appears somewhat hasty criticism, there being little more similitude between the Southern and Northern schools of tracery than there is between point-lace and Honiton flowers. The *Jalee* of Upper India is a fine filagree of marble or sandstone fretted into an almost endless network of geometrical combinations, such as can only be understood by seeing the carvings themselves or good photographs, if then. If then, because such is the complication of the lines that the greatest geometricians may be puzzled to analyse the designs. The same author thus accounts for the invention of this art:—"Every form of a Hindoo temple was repro-" duced except in one particular. In the angles of " all Hindoo temples are niches containing images. " This the Moslem could not tolerate, so he filled them " with tracery. . . . After a century's experience they " produced forms which as architectural ornaments, " will in their own class stand comparison with any " employed at any age or in any part of the world; " and in doing this they invented a class of window " tracery in which also they were unrivalled."

In Northern India the use of some material that should, like glass, afford protection from weather, while, unlike glass, it admitted of free ventilation, led to a great elaboration of this last or window-tracery class. Almost all the Pathan and Moghul buildings are full of these minute yet everlasting pieces of fretwork. The marble screens that go on all four sides of the open chamber on the summit of Akber's mausoleum at Sikandra are as fresh as when first executed more than two hundred and sixty years ago, and each screen contains twelve panels, except where a panel in the centre has been left open for the view, and there are three different patterns of panel in each screen. The upper chamber of Itmad-ood-Dowlah's tomb is all lace-work of the same kind; and the Fort and Taj have also elaborate examples of this work, one panel in the screen round the cenotaphs in the latter being carved out of a single slab of marble over six feet high.

Of marble tracery at Delhi there are fine examples of all ages, probably all the work of Hindoo artizans, and appearing to increase in fineness and intricacy as it reaches modern times. Among the earliest are the window screens in the beautiful building, just behind the Kootub Minar, known as Ala-ood-Deen's gate, and dated A.D. 1310. The tracery here is bold and massive, in harmony with the tone of the whole work, which is the finest specimen extant of the first Pathan period. In the enclosure of Nizam-ood-Deen's tomb (close by the mausoleum of the emperor Humayun) are tracery screens in white marble from the middle of the fourteenth century down to that of Meerza Jahangeer, constructed in 1832. As a mere piece of workmanship this last exceeds the rest; and the tombs comprised in this small cemetery will be found very interesting to those who wish to compare the work of various distant epochs.

But all the marble-work of this region is surpassed by the monument which Akber erected over the remains of his friend and spiritual counsellor Shekh Suleem Chishtee at Futtehpoor-Seekree (1581, A.D.). In the N.W. angle of a vast courtyard, 433 ft. by 366 ft., is a pavilion, externally of white marble, surrounded by a deep projecting dripstone, of white marble also, supported by marble shafts crowned by most fantastic brackets, shaped like the letter S. The outer screens are so minutely pierced that they actually look like lace at a little distance, and illuminate the mortuary chamber within with a solemn half-light which resembles nothing else that I have seen. The whole of this elaborate work, including the strange but most pleasing design of the brackets, appears to have been produced by the resident stone-cutters of the place, uneducated men earning probably an average wage of about a penny a day. I believe that no instance of such pure patient workmanship, so dignified yet so various, is to be found in the world. The sand-stone *Jalee* is used sometimes in the interior of apartments, such as the female galleries, from which, as in our House of Commons, the ladies could look down on the meetings of men in halls below. But more commonly the work occurs in balustrades and parapets, where it has a fine effect. This stone comes from the Futtehpoor quarries or from Bhurtpoor; the white marble from the Jaipoor territories. The difference both in the cost of material and labour is very great; a small slab of marble carving of this kind will cost 10*l*., while one of sand-stone can be obtained for one tenth of the price.

Lastly must be mentioned the modern practice of carving in soap-stone. This material appears to be a steatite of particularly rough texture and a warm grey tint. It comes from a place in the dominions of H.H. the Maharaja of Jaipoor, and stands like leather, though it cuts like cheese. It forms into beautifully sharp patterns, either floral or arabesque, which are made into boxes, card trays, and such like articles of drawing room use. But a time may be hoped for when this cheap and pretty work may be extended to architectural decoration. I am not informed as to its powers of standing weather; but in the interior of halls and reception rooms its introduction on white walls and ceilings would have a fine effect, either as cornices or mantel-mouldings. A handsome piece of soap-stone carving may be had for a few rupees; and the decoration of a whole dining room with it would hardly be more expensive than the decoration of the same walls with English paper-hangings.

Madras Committee.

Block of soapstone, "Balapam." From Salem Taluk.

Bombay Committee.

Coloured stone (6 specimens). Black, red, deep red, purple, crimson, and sparkling white. From Surat.

Coloured stone (2 specimens). Yellow and green and red. From Kutch.

Black stone (with two of its sides polished). From Kolapore.

Bengal Committee.

Stone, "Thala." Platter. From Balasore.

Stone, "Bàte." Cap. From Balasore.

Stone drinking cup, with cover. From Balasore.

Made of a kind of black magnesian rock intermediate in composition between potstone and serpentine, approaching the former in appearance, but of a less greasy grain. It is quarried at the villages of Santragadia and Gujadiha, a few miles south of Nilgiri in the hills bordering on Balasore. These vessels are cut roughly into form in the quarry and finished in the villages by finer tools, lathe-turning, &c.

Ambler, Monghyr.

Circular slate trays (2).

N.W. Provinces Local Committee.

Specimens of agate in the rough state. From Banda.
Moss agates (7 specimens). Square and oval. From Banda.
Agate paper knives (3). Banda.
Jasper, in the rough state (4 specimens). Banda.
Jasper knife handle (6). Banda.
"Kunkar" (2 specimens). Nodular limestone. Banda.
Petrified teeth. Banda.
Crosses (2). "Ghori Sulaimani." Banda.
The above stones are found in the rough state in the bed of the Ken river. Their high market value sufficiently proves their value and rarity.
Onyx Necklace.
The stones of which this necklace is composed are found chiefly in the mines and jungles of the Banda district.

Punjab Committee.

Pestle and mortar. Green stone (plasma). From Shahpur.
Pair of bracelets. From Shahpur.
Knife handles. Brown stone (a variegated marble). From Shahpur.

Dr. Leitner, Lahore.

Specimens of Lahore encaustic tiles.
These tiles are from old monuments, but the colours on them are as vivid as ever. This art connected with Mogul architecture is almost dead, as no encouragement is now given to its very few surviving professors.
Serpentine vases from Skardo, the rock capital of Little Tibet on the Indus, which is surrounded by steep glaciers and mountains where gold is said to abound, especially near the Nagyr glacier.
Two Agra marble plates, and two paper weights inlaid with precious stones.

India Museum, London.

Paper weights (2). Inlaid marble. Agra. From the London Exhibition of 1872.
Paper weight. Carved soapstone (steatite). Agra. From the London Exhibition of 1872.

SECTION II.—EARTHENWARE.

Madras Committee.

Earthenware goglet. From Madras.

Madras School of Art.

42 Terra-Cotta Casts of Hindoo Temple Ornamentation as follows :—

Cunniah Komareh, with ornamental scroll. Tadputry.
Ornament in 3 pieces, with griffin's head. Vellore.
Ornamental pillar with a male figure at base, in 3 pieces. Humpey, L. L. L.
Panel ornament, with dancing figure and a female figure at the base, in 3 pieces. Humpey, K. K. K.
Running ornament, 2 pieces. Humpey, P. P.
Corner ditto ditto ditto
Perforated star-pattern, 2 ditto ditto
Running ornament, ditto ditto ditto
Perforated panel. Tadputry.
Ornamental frieze in 6 pieces. Vellore. N.
Plinth for the ornamental frieze, in 6 pieces. Vellore. O.
Lily ornament. Veringeepooram.
Square ornament. Veringeepooram.
Ornament with 2 parrots. Veringeepooram.
Ornamental scroll with Yalee, 2 pieces. Tadputry.
Lily floriated. Tadputry.
Circular ornament, 4 griffins' heads. Tadputry.
Ornament with 4 geese. Tadputry.
Lotus flower on a square slab. Tadputry.
Circular ornament. Tadputry.
Running ornament, in 2 pieces. Tadputry.
Border ornament. Tadputry,
Ornament floriated. Tadputry.
Running rope twisted ornament, with Yalee, in 3 pieces. Vellore.
Circular ornament on square. Vellore.
Running ornament, star-pattern, in 2 pieces. Peroor.
Running ornament, 2 pieces. Peroor. D. D.
Ornaments. Peroor.
Running ornament, young plantains, in 2 pieces. Peroor.
Floriated ornament, with lotus flower. Peroor.
Running ornament, in 2 pieces. Peroor.
Ornament with 6 birds. Peroor.
Lotus ornament, in 2 pieces. Peroor.
Ornament with 8 parrots. Conjeveram.
Scroll ornament in 2 pieces. Conjeveram. B. B.
Square ornament. Conjeveram.
Running ornament, in 2 pieces. Conjeveram. A. A.

Compaddy, Goodiathum Taluk, North Arcot.

Flower pots (4). Large and small.
Cooling pots (2), and ice pots (2).
Butter pots (4). Plain and flowered.
Goglets (6). English, Mogul, and Carnatic.
Goglets (4). With enlarged mouths and of dark colour.
Teapots (2), and cups (4).

Bombay Committee.

Pipes (6). From Aden.

G. W. Terry, Bombay.

Plaster Reproductions of Architectural Ornaments from Ambarnath Temple.

1. Inscription.
2. Circular ornament at the base of one of the stone ribs on the Vimanah.
3. Stone ribs; part of ceiling in western doorway.
4. Stone ribs; part of corner in Mandup.
5. Ornamentation of pillar. Southern doorway.
6. Decorated moulding of verandah.
7. Half pillar of Mandup, in 7 pieces.

H.H. the Guickwar of Baroda.

Goglets (13). Black and red. Inlaid with silver and gold. Baroda.
Goglets (2). Inlaid and mounted with silver, and furnished with silver lids.

Bowls with lids and stands (2). Inlaid with silver.
Bowls (4), with lids and stands. Inlaid with silver, and embellished with paintings and relievos. Baroda.
Cups (12). Inlaid with silver. Baroda.
Hooka bowls, "Chillum." Inlaid with silver. Baroda.
Spittoons (2). Mounted with silver. Baroda.
Water pots (2). Inlaid and mounted with silver. Baroda.
Kettle, soap box, &c. Inlaid with silver.

Bengal Committee.

Glazed earthenware (11 specimens), consisting of goglets ("suroy"), cups, hookahs, &c. From the Sonthal Pergunnahs.

Black Pottery (26 specimens) from Sewan, Sarun District.

Tea-pot, milk-jugs, sugar-bowls, and cup and saucer.
Covered bowls, mugs, and pans.
Soup tureen with cover and stand, and soup plate.
Huka with "Chillum" (tobacco-burner) and "Sarpose" (cover), spittoon ("Ligaldan")
Goglet ("Surahi") with cover and water-jug.
Butter-pot, flower-vase ("guldan"), fire-holder ("agdan").
Egg-cup, salt muffineer, and paper weight.
Earthen lamp, "Chirak" or "Chirag," with stand. From Sylhet.
Water-pots ("Kulsi") and milking pail ("Char"). From Sylhet and Howrah.
Earthen tobacco-burners ("Kolka") and tinder box ("Chakmaki"), with flint, steel, and tinder. From Hugli.
Earthen cooking utensil ("hari") with cover ("sara").
Rice-bowl ("Khola").

N.W. Provinces Local Committee.

Collection of Umroha pottery (40 specimens). From Umroha.
Figures (12) of native artisans, &c. From Jaloun.
Collection of Indian fruits and vegetables (20 specimens). Modelled in clay. From Jaloun.
Models of Indian fruits. From Furruckabad.

Dr. Leitner, Lahore.

A Lhassa China tea-cup and basket.
The cup or bowl is most curiously but safely ensconced in a basket slung across the waist of the traveller.
Specimens of Lahore coarse porcelain.
The Lahore porcelain is the last attempt at an art which will die out unless encouraged.
Cups made at Kheora from unburnt plaster.

Oude Local Committee.

A set of figures and models (of men, animals, buildings, fields, &c.), which, when put together, form a miniature village.
Among the objects represented by this interesting specimen of native ingenuity will be found the following:—
House of Jamadar (chief revenue officer).
House of Patil (head man of the village).
House of cultivator.
House of Pattidar (holder of a share in a village "patti" or estate).
House of Bunnea (shopkeeper).
Houses of oilman, milkman, &c.
Roads with passengers.
Markets for grain, vegetables, pottery, &c., with purchasers.
Roads with carts and passengers.
Lake with people washing clothes.
Fields with cultivators sowing grain, ploughing, cutting grass, &c.
Melon and pumpkin fields.
Cart drawn by four bullocks.
Bullocks with grain.
Cultivator driving bullocks to the field.
Punjabi well, and well with person drawing water.
Fakeer sitting near his fire-place, with his four pupils.
Small garden.

N.B.—The majority of these were broken in transit past recovery.

Bhopawur Pul Agency.

Hookah, with earthen bowl, cocoa-nut water receptacle and wooden pipe; for smoking tobacco.
Earthen domestic utensils. "Hundee" (cooking vessel), "Kudela" (baking pan), Taori and Khapru (dishes).
Gharra (water-pot), and "Kuldi" (drinking vessel).

Peerano, Son of Joomo, Kashigur of Tatta Sind.

Earthenware Domestic Utensils, &c. (95 specimens). Variously coloured.

Cups and saucers.
Pots, "Mookhba." For preserves or pickles.
Covered dishes ("Dhakoo"), plates.
Goglets ("Kurro") and water-pots ("Lota").
Drinking vessels ("Vutta"), cups, tumblers, &c.
Hookas, "Zenana" and "Chillumchee."
Flower-pots with saucers, flower vases.
Rose-water bottle ("Goolabdanee"), milk-pots ("Chowuree"), ink-pots, &c. &c.
Floor tiles, various colours.
Floor tiles (16), forming a pattern.
Ornaments.
Ornament ("Neele") for spire, in 9 pieces.
Specimens of the various materials and implements used in the manufacture and glazing of pottery (37 specimens).
Clay, prepared and unprepared.
Tools (6) and paper patterns (6) used in making glazed pottery and tiles.
Wooden mould and earthenware "maul" used in the manufacture of tiles.
Various substances used in glazing and colouring, such as "Moordarsing" (litharge), "Sendoor" (red lead), "Lajwarde" (lapis lazuli), a blue colour; Sahree (clay paste), prepared and unprepared; "Dha" (earth), red and black; "Casheejo-rung" (white glazing composition); Waree (sand), flint, &c. &c.
Specimens of pottery (water-pots, dishes, and tiles) in various stages of manufacture.

The following note on the "*Process of Making and Glazing Earthenware*" is sent by the Local Committee.

The clay required for this purpose is obtained 10 feet under ground, in situations which have been inundated. It is reduced to a fine powder and

soaked in water for 24 hours, after which it is kneaded with the hands and feet until it becomes dough-like. Lumps proportionate to the articles to be made are then mounted on a wheel and formed into the required shape. After the vessels have dried, they are again put on the wheel, and finished by means of an iron tool (samples of which have been sent). Tiles are prepared in moulds, and when dried are rubbed over with a piece of wet cloth and beaten with an earthen "maul" for the purpose of smoothing the surface; they are then kept for two or three days or more till they become sufficiently firm, and after having been cut to the proper size, are piled on layers in the sun to dry.

The vessels, tiles, &c. having been sun-dried, may then be sent to the kiln, after which the required pattern is traced on them in the following manner. A perforated paper pattern (see specimens sent) is placed upon the article, and powdered charcoal sprinkled over it. On removing the paper, the pattern remains on the earthenware, and is then brushed over with a solution called "Sahree," the description of which is given below.

When this is dry, glaze of the required colour is prepared and poured over it; the article is then allowed to dry again, after which it is placed in the glazing kiln, and subjected to the required amount of heat. The articles are only removed after the kiln has become cold.

Preparation of "Sahree."

"Sahree" is clay found only in the vicinity of Sehwan, and vended at Hydrabad (Sind) at a rupee per maund (82 lbs.). When required for use it is put into a large vessel over night, with water enough to cover it. In the morning it is found to have attained the consistence of paste, and this being strained, it is ready for use.

Preparation of "Moordarsing" (Litharge).

For *green* colouring two pounds of "Sendoor" (red lead), one pound of "Waree" (sand), and a quarter of a pound of carbonate of copper are mixed together and put into an unbaked vessel previously plastered over on the inside with a mixture of "Waree" (sand) and "Sahree" (clay). This vessel is then placed in a heated oven, when the articles are melted together and form a hard substance, used for colouring green. When required for use it is ground to powder in a hand-mill, sifted, and mixed with wheat paste.

For *red* or *yellow* colouring, the process is the same as above described, substituting red "Dha" or earth for the carbonate of copper.

For *purple* colouring, instead of a solution of "Sahree" the baked tile or vessel is washed over with black "Dha" (earthen), and the "Moordarsing" for red or yellow colouring is used as a glaze.

For *blue* colouring or glazing, lime obtained from the flint of the sample sent, is freely powdered, sifted, and mixed with wheat paste. This mixture is poured over the unbaked article and allowed to dry. "Lajwurde," a blue colour, is then ground on a stone with water, to the consistence of paste, and brushed over the prepared article. When dry "Kashee" or white glazing matter is put on, and the vessel placed in the kilns as before.

If the "Lajwurde" (Lapis Lazuli) used in the last process be omitted, the result will be simply a white glaze.

"Cashee-jo-rung" or glazing composition.

This is made of four parts of "Chaneo" (alkaline earth) and one part of "Jubbul-jee-waree" (hill sand). These are mixed together and placed in the kiln to melt. The substance thus obtained by fusion becomes the glazing material, when it is added to paste and used as other pigments.

Ancient brick from Tatta.

Bricks from the ruins of Bumboor.—These bricks were obtained from the site of an ancient city at present known by the name of "Bumbura," or the Kafir or Infidel City. There are reasons to suppose that this ancient place was known during the eight century as "Diwal" or "Dawul," when the Mahomedans under Mahomed bin Cassum invaded Sind. It was the first city stormed by him. It is said that the catapultas he used in the siege were brought by sea to the place, and that it was then the principal seaport of Sind, on the western branch of the Dalta of the Indus. There was a temple of renowned sanctity in the fort at the time of its destruction, and hence it has been called by subsequent Mahomedan Historians "Dawul" or Temple, but it would appear that before the Mahomedan conquest it was known as "Mahaara" or "Munsawar." In *Arrian's Periplus* it seems also to be the same, mention together with "Gharra," the first probably as "Barbarike," and the latter as "Minaghara," both described as the first ports situated at the mouth of the Indus, which he calls "Scynthus."

Major Rennell, in a map compiled by him in the year 1783, places "Dawul" in the position of this ruined City.

Cabil and Yarrow, of Halla, Haidarabad, Sind.

Specimens of pottery, consisting of domestic utensils (of a similar description to those of the preceding exhibitor), tiles, mosaic-work, &c., &c. 150 specimens.

Collection of ancient tiles, as follows :—

These interesting relics should be looked at in connexion with the photographs (by J. Mitchie and Co.) of the tombs from which they were taken. *Vide* Notes referring to these photographs

Tiles from the tomb of Ameer Khuleel Khan.

Tiles from the tomb of Nawab Ameer Khan.

Tiles from the tomb of Dewan Shoorfa Khan.

Tiles from the tomb of Mirza Bakee Tur Khan.

Tiles from the tomb of Mirza Janee Beg and Ghazee Beg.

Glazed tiles from the ruins of Kullan Kote or the Great Fort.

The tiles sent were procured from the ruins of this fort, which is said to have been built in 824 Hijree (A.D. 1421), on the ruins of a still more ancient fort, said to have been in existence before the Mahomedan era. It is situated near the north or right flank of the "Buggár," or western branch of the Indus, about four miles south of Tatta.

Glazed tile, found 12 feet below the surface of a building more than 400 years old. From Tatta.

Glazed tiles, from the ruins of the old Portuguese Chapel, at Tatta, Sind.

The town of Tatta was built in 872 Hijree (A.D. 1467), by Jam Nizamoodeen Summa (or, as he is more commonly called, Jam Ninda).

The fort, however, was commenced about 1111

Hijree (A.D. 1699), by Nawab Hifz-Oolla, in the time of Aurungzebe, but was never completed.

The tiles sent to the Exhibition were procured below the surface from the ruins of an old building and the old Portuguese Chapel at Tatta.

The above is a summary of information communicated by Syud Hoossain Ali Shah, son of Syud Sabur Ali Shah, of Tatta, from reference to a manuscript entitled the "Tofut-il-Kiram" (gift for the blessed) in his possession, being a local history compiled by his family. Syud Shukkuroolla, his ancestor, settled at Tatta in the year 927 Hijree (A.D. 1521).

Saboo, of Nussurpoor, Haidarabad, Sind.

Tiles, various colours, plain and with pattern. 67 specimens.

Rutto Wullud Mengho, of Haidarabad, Sind.

Specimens (32) of pottery. Cooking vessels, water-pots, drinking vessels, hookas, &c.

Joomo, son of Oosman, potter, Karachi, Sind.

Collection of pottery (89 specimens).

Among the most interesting specimens in the collection are the following :—

Hookas and Hooka tops ("Chillum Topee.") used by Hindoos, Pathans, Arabs, people of Sind, Kutch, and Jessulmere.

Pipes (Chillum Safee). Used for smoking without a Hooka.

Mode of use.—A piece of cloth is put on the mouth of the pipe, which is held between both hands when smoked.

Lamp ("Deeatee").used by Mahomedans only on one night of the year, the Shah-i-Barat, or Night of Record.

Earthen vessel ("Pulla Matee"), used as a float when fishing in the Indus for the pulla. With net and rods, &c. complete.

Manner of use described by the late Captain Postans (in his work entitled "Personal Observations on Sind"), as follows :—First placing on the water a large earthen vessel, and commending it to the care of Allah, the fisherman casts himself on it in such a manner that the mouth of the vessel is completely closed by the pressure of his stomach; he then paddles himself by means of the action of his hands and feet into the centre of the stream, holding deep in the water a forked pole about 15 feet in length, to which is attached a large net; in his girdle he carries a small spear, and a check-string attached to the net indicates the moment when a fish is entangled. The spear is used to kill the fish when drawn up after capture, and the jar receives the spoil.

The *Pullah* (the Hilsah of the Ganges in sable fish) swims against the stream. The fisherman therefore walks some miles up the river bank, and then floats down it until he has secured sufficient for his day's sale or consumption.

Coffee-pot ("Kavadanee"), water-pots, milk-pots, &c.

Earthen vessels (Goorburro) for keeping confectionery, used by Hindoos.

Cooking vessels, drinking vessels, and other household articles.

Toys, tiles, bricks, &c.

NOTE on the pottery of Rutto Wullud Mengho, and of Joomo, son of Oosman.

"The clay is cleaned as much as possible, that is, freed from gravel &c., and mixed with some siliceous substance in the proportion found necessary to prevent the clay from cracking or splitting when baked. The dough thus made is allowed to undergo a sort of fermentation for a short time before being brought into use. A sufficient quantity is then placed on the centre of a wheel revolving horizontally. This wheel is generally a disc of limestone, and sometimes of clay, according to the circumstances of manufacture. The wheel is revolved on a pivot by a stick inserted in a notch near the rim. When the wheel has attained a sufficient velocity, the manufacturer manipulates and fashions the clay into the required vessel, which is then taken off the wheel and sun-dried. Before burning, the colour (samples of colour are sent) is mixed with water, and applied to the article in the required pattern."

J. Mitchie and Co.

Photographs of Ancient Tombs, as follows :—

Tomb of Ameer Khalleel Khan. (Built between the year 980 and 993 Hijree [A.D. 1572 and 1585] on the "Muklee" range of hills near Tatta.)

This tomb was built during the lifetime of the Ameer Khulleel Khan; but he is said to have been so conscientious a man that he would not permit his body to be interred therein, being apprehensive injustice might have been done even in building it. He therefore desired that his body should be buried near it. Seven *hafizes* or religious devotees were buried in the tomb.

The small tomb to the right is where the Ameer was actually buried, and which is situated in the enclosure of the large tomb.

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Tomb of Nawab Ameer Khan. (Built about the year 1050 Hijree [A.D. 1640] on the "Muklee" range of hills near Tatta.)

Nawab Ameer Khan was the son of Nawab Kasim Khan, and was deputed as Governor of Sind in the beginning of the reign of Shah Jehan, the Emperor of Delhi, in Hijree 1037 (A.D. 1627), and remained as such till 1042 Hijree (A.D. 1632.)

He was sent a second time in 1051 Hijree (A.D. 1641), and ruled till his death, which took place in 1060 Hijree (A.D. 1650).

The Ameerkhanee Syuds are descended from him.

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Tomb of Dewan Shoorfa Khan. (Built in 1049 Hijree [A.D. 1639] on the "Muklee" range of hills near Tatta.)

Dewan Shoorfa Khan was the grandson of Meer Ullek Urgon. He was "Dewan" or Minister during the government of Nawab Ameer Khan, and remained in office up to the year 1054 Hijree (A.D. 1644). No further account of him is given.

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Tomb of Mirza Bakee, son of Mirza Eesa Turkhan. (Built about 993 Hijree [A.D. 1585] on the "Muklee" range of hills near Tatta.)

Mirza Bakee Turkhan assumed the Government of Lower Sind on the death of father, Mirza Eesa, in the year 980 Hijree (A.D. 1572), and died in the year 993 Hijree (A.D. 1585). Mirza Eesa, the father of Mirza Bakee, was the first of the Turkhans who governed Lower Sind. On the death of Mirza Shah Hussun Arghoon, who ruled over Sind, and died without issue, the province was divided by two Chiefs. Sooltan Mahomed Bukree took Schwan and all to the North, and Mirza Eesa, the remainder.

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Tomb of Mirza Janee Beg, son of Payend Beg Turkhan; and Chazee Beg, son of Janee Beg Turkhan. (Built about 1009 Hijree [1600 A.D.] on the "Muklee" range of hills near Tatta.)

Mirza Janee Beg, son of Payend Beg Turkhan, was the last of the Turkhans who governed Lower Sind, the capital of which was Tatta. He succeeded to the Government on the death of his grandfather, Mirza Bakee Turkhan, in the year 993 Hijree (A.D. 1585), his father being mad and unable in consequence to carry on the Government. He had ruled for seven years when Abdool Rahil Khan, a Nuwab or Lieutenant of Akbar, the Emperor of Delhi, conquered Sind.

Mirza Janee Beg having proceeded to Delhi, tendered his allegiance to the Emperor, by whom he was received graciously and a title conferred on him. The country was restored to him, but he was not allowed to return to Tatta. The government was carried on by his agents until his death, which took place in 1008 Hijree (A.D. 1599), when his son Ghazee Beg was called to Delhi. Ghazee Beg remained there some years, after which he was appointed Governor of Candahar, over which province he ruled until his death, which took place in 1020 Hijree (A.D. 1611).

Both he and his father were after death carried to Sind and buried in this tomb.

The above is a summary of information communicated by Syud Hoossain Ali Shah, son of Syud Sabur Ali Shah, of Tatta, from reference to a manuscript entitled the "Tofut-il-Kiram" (gift for the blessed) in his possession, being a local history compiled by his family. Syud Shukkooroolla, his ancestor, settled at Tatla in the year 927 Hijree (A.D. 1520).

Photograph of convict potters at work in the Karachi jail.

The man in the centre of the picture is represented putting his wheel in motion. When it has acquired sufficient velocity, the stick is thrown aside and the pottery placed on the wheel, fashioned. The left-hand figure is represented fashioning an earthen pot with a beater held in the right hand. In the left hand inside the pot, a rest, represented in the foreground, is held.

Photograph showing potters' yard, on the bank of the "Lyaree" River, near Karachi, with potters at work.

The man represented standing on the right of the picture is kneading the clay which has been previously prepared in the pit represented on the right. The centre figure is represented with a lump of unfashioned clay on the wheel.

The left-hand figure shows a drain pipe on the centre of the wheel which, on being removed, is cut so as to bisect it longitudinally, but not quite divided, and thus the pipe fashioned is easily formed into two pan-tiles.

The background represents the kilns. Rubbish is used for burning the pottery.

Photographs from a print in "Postan's Sind" of a Pullah fisherman. (*Vide* note to "Pulla Matee," exhibited by Joomo, son of Oosman, Karachi.)

Specimens of the cylinders, knobs, and tripods, used in the process of glazing pottery.

The knobs are used for one set of articles, and the tripods for another. The former being used for vessels of a coarser and larger description. The knobs and tripods are never used together, but separately on the cylinders, and the ware is reversed while undergoing the process of glazing, as shown in the diagrams.

India Museum.

Pottery from Berar. (From the London Exhibition of 1871.)

GROUP X.—SMALL WARE AND FANCY GOODS.

SECTION I.—MANUFACTURES OF MEERSCHAUM, TORTOISE-SHELL, HORN, BONE, IVORY, MOTHER-OF-PEARL, WHALE-BONE, &c.

Madras Committee.

Writing-desk. Buffalo horn and ivory. Vizagapatam.
Blotting-book. Buffalo horn and ivory. Vizagapatam.
Envelope cases (3). Buffalo horn and ivory. Vizagapatam.
Bookslide and inkstand. Buffalo horn and ivory. Vizagapatam.
Stamp-box, paper-weight and paper-cutter. Buffalo horn and ivory. Vizagapatam.
Work box. Buffalo horn with sandal-wood fittings. Vizagapatam.
Carved ivory glove stretchers. From Travancore.

H.H. The First Prince of Travancore.

Card case. Carved ivory (Indian subjects). Travancore.
Paper-weight and paper-knives (3). Carved ivory (Indian subjects). From Travancore.
Carved flower stand, with gilt copper snake entwining it.
Carved cocoanut shell.

Bombay Committee.

Carved bison-horn figures (animals). From Belgaum and Rutnagheery.
Flower dish with stand, carved bison horn. From Rutna gheery.

Surat Sub-committee.

Carved ivory figures (of men, animals, &c.) From Surat.

Guickwar of Baroda.

Dish, spoon, knife, &c. of horn. From Baroda.

Framjee Heerjibhoy, Bombay.

Ivory alphabets (60 sets).
Carved ivory glove boxes (2), Bombay and China work.
Paper-cutters (12,) combs (5), and pen-stand. Carved ivory.
Tortoiseshell paper cutters (2).

Cavûsjee Munchurjee, Bombay.

Desks, glove boxes, card cases, chess-boards, paper-cutters, and other fancy articles, in ivory, bison horn, and stag horn.

Bengal Committee.

Collection of ivory carvings. From Berhampore :—
Model of a boat.
Model of a pleasure barge.
Model of a "bhur" or boat for carrying produce.
A native gentleman.
A native gentleman reading.
A cup and ball.
A "boistum" or Hindu mendicant.
A cow and calf, with milkman.
An elephant and howdah with grandee, sword-bearer, and four spearmen.
A double ruth with bullocks, driver, and two passengers.
Saggur or hackery with bullocks and driver.
A plough with pair of oxen and ploughmen.
An elephant with state howdah, trappings, nobleman, and attendants.
A palki with passenger, eight bearers, two link-men, and two baggage coolies.
A brahminy or sacred bull.
An ekka with pony and driver and passenger.
A single ruth with bullocks, driver, and passenger.
Figure of a Mogul.

Ivory ear-cleaner. "Hathi-dant-ka-kankhaski." Sylhet.
Bracelets. From Sylhet.
Tube ("Tufungair chunga") for shooting, with darts ("Tir"). From Sylhet.
Ruler. From Sylhet.
Shell bracelets. "Sunka." From Sylhet. Eight rings, four for each wrist. These are made for the women of the hills round Sylhet at Dacca, which has long been known for the manufacture of such bracelets. The "chank" shells which are sliced into rings to form these bracelets are obtained from the west and north-west coasts of Ceylon and from the Maldives, and the trade in them is one of great antiquity in Ceylon. The shells are known by the scientific name *Turbinella rapa*. The "Shakhas" or shell workers at Dacca distinguish the several shells and their various qualities by the names Titkuri, Pati, Lalpati, Ala bela, Dhala, Kulai, and Shurti; the Titkuri being the best in quality of grain, lustre, and suitability for fine cutting and delicate finish. There is considerable variety in the patterns of these "sankha" bracelets, from the rude broad flat ring to the thin delicate armulet, rounded, or with notched or beaded edges, carved with tigers' heads, enriched with ornamental incising, and illuminated by touches of tinsel, lac-colour, gilding, &c. A large series was sent to Kensington last year accompanied by specimens of the shells both before and during the process of manufacture, together with the tools used and photographs showing the men at work.
Pair of gala or lac churis (bracelets), from Boodbood Division, Burdwan district.
Pair of horn bracelets, from Monghyr.

Babu Sridhur Sahi, Zemindar of Maujha Sarun District.

A "Chousar" or "chak." Dice board (made of beads) with the 19 pieces used for playing the game of "Pasa."

Dr. Leitner, Lahore.

Yarkandi jade pipe stem, waistclasps, wristlets, and armlet. Jade is only to be got from one quarry, and is highly prized. It is used to make the buttons and bars which constitute the distinctions of mandarins. Jade is also made into cups, bowls, pipes, &c. &c. The pipe stem has been sent with several other articles by Niaz Muhammad Akhun, the first Yarkandi who visited Europe (in 1869, when he was brought over by Dr. Leitner).

A lamp made at Kheora from rocksalt. The substance of which it is composed hardens in hot, and softens in cold water (?).

A set of native women's ear and nose ornaments made of tinsel and wood, also beads of wood (two dozen strings), brooches, armlets, wristlets, bangles, comb, &c.

A Bombay ivory workbox and two stamp boxes.

Two paper cutters, one of agate from Jabalpur, the other of sandal-wood, inlaid.

A Chinese workbox fitted with ivory cases, drawers, &c. &c. (possibly made at Bombay). A very good specimen.

India Museum, London.

Ivory carvings from the London Exhibition of 1872.
Knife handles. Rangoon.
Figure of woman reclining. Punjab.
Equestrian figure. Punjab.

Col. Michael, London.

Elephant tusks (4).
Sambur horns, mounted on shields.
Gour skull and horns, mounted on shield.
Neilgherry ibex skull and horns, mounted on shield.
Jungle fowl hand-screens (4).
Gour horn cornucopias, native mounted.
Tiger skull inkstand.
Tiger skull letter-box.
Elephant foot footstool.
Black-buck heads (2), native stuffed.

Edwin Ward, London.

Monal pheasant screen, with basket.
Snow pheasant screen, with basket.
Black partridge single screen.
Pair of roller screens.
Monal hat and muff.
Peacock hat and muff.
Jungle fowl hat.
Roller hat.
Tiger skull cigar and tobacco stand.
Tiger tooth inkstand.
Tiger tooth seals (2).
Tiger claw paper knife.
Tiger skull flower stand.
Casts of tiger's brain (2).
Boar tooth back comb.
Boar tooth match and spill holder.
Deer foot candlestick.
Deer foot cigar stand.
Gour hoof candlestick.
Wild horse candlestick.
Bear claw letter rack.
Black buck horn match box.
Bear claw jewellery. Suite, consisting of earrings and brooch, in case.
Tiger claw jewellery. Suite, consisting of earrings and brooch, in case.
Tiger claw earrings.
Tiger tooth brooch.
Musk deer tooth brooch.
Indian bear claw brooch.
Beetle wing jewellery. Necklets (3) and coronet.
Set of photographs.

SECTION II.—TOYS AND WAX WORKS.

Madras Committee.

Collection of Toys. From Nakkapilly.
Models of mango fruit and custard apple. From Condapilly.

Seshia, the Tahsildar of Nursapore.

Series of figures representing various native trades and classes. From Nursapore.
The collection includes the following :—
Potter making chatties.
Barber.
Dhobie (washerman).
Cooly with chatties.
Dhobie woman.
Fisherwoman.
Wadder (road maker and tank digger).
Beggar.
Fakeer.

Nawab of Banaganapilly.

Native playing cards, "Gunjefors." (4 boxes.) From Kurnool.

Bombay Committee.

Carved wood figures (of animals). Belgaum.
Carved wood figures (14), illustrating various native classes, trades, &c. From Belgaum.
Among the most interesting are the following:—
Bheestie (water carrier).
Woman spinning cotton.
Woman grinding corn.
Woman making cotton thread.
Woman carrying water.
Milkmaid.
Juggler with implements.
Weaver at his loom.
Husbandman at the plough.
Dhobie (washerman).
Figures illustrating various classes, professions, and trades of India. From Poonah.
The collection includes the following :—
Brahmins, seated on low wooden stools ("pat") at dinner. (Five figures.)
Brahmins (men and women), variously engaged at work. (Six figures.)

Man with bullocks, thrashing grain.
Group of women carrying water from a well.
Cultivator (" coombee ") at work with plough and bullocks.
Blacksmith's shop, with three figures.
Man with loom weaving silk and brocade cloth.
Snake charmer and juggler.
Group of women engaged in washing, picking, grinding, and sifting corn.
Group engaged in winnowing grain.
Woman engaged at cotton spinning.
The shop of a fruit and vegetable seller (" maleen ").
Shop of " bunnea " (grocer).
Shop of native shoemaker, with man and woman at work.
Playing cards. From Sawantwaree.

Surat Sub-committee.

Carved wood figures of animals. (26 specimens.) From Surat.

H.H. the Guickwar of Baroda.

Glazed figures (of animals, fish, &c.). From Baroda.

Mysore Local Committee.

Collection of Chennapatna toys.

SECTION III.—SMALL WARE AND FANCY GOODS OF LEATHER AND BRONZE, LACQUERED WORK.

Bombay Committee.

Models of subjects in Hindoo mythology, animals, &c. From Bombay.
Inkstand, pen-box, and betel-nut cutters. From Bombay.

Bowany Hurryvalubh, Bombay.
Bowanysheenker Hurryvalubh, Bombay.

Sets of wooden " Karamdas (flat and globular). From Kurrachee.

Cavusjee Munchurjee.

Penquill workbox and glove box.
Penquill cigar cases and pen case.

Baboo Gopal Chunder, Opium Department, Benares.

Beaded penholders (2), and pen wipers (2).
Silk-wound penholders (4).
} Fancy work of native ladies.

Punjab Committee.

Box. Leather and peacock work. From Simla.
Box. Leather and horsehair work. From Simla.
Cheroot cases (2). From Simla.
Hooka and " Chillums " (pipes). Fancy leather work. From Sirsa.
Hooka bowl. Leather and brass fancy work. From Kasur.

Dr. Leitner, Lahore.

A native lady's pan (betel nut) box, with a mirror.
Ditto toilet case in brass.

India Museum, London.

Hooka opium pipe and case. (From the London Exhibition of 1872.)

SECTION IV.—CANES, WHIPS, UMBRELLAS AND PARASOLS.

Madras Committee.

Umbrellas (2). Made of the leaves of the Pandanus odoratissimus. Used by natives of lower classes in Southern India. From Madras.
Umbrellas (2). Made of rushes. From Madras.
Umbrellas (2). Used on the Western Coast by high caste Brahmins. From Calicut.
Umbrellas (2). Used by Tier females. From Calicut.
Umbrella hats (2). Used by lower castes of females. Calicut.
Umbrella hats (5). Used by fishermen and labourers. Calicut.
Fans (22). Made of Palmyra leaves, Khus-Khus (grass) roots, peacock feathers, and palm leaves. From Calicut.
Fans (4). Painted Palmyra leaves, with silk borders. Tanjore.
Talc fans (9), with fringe of silk and gilt filagree. Tanjore.
Rice, paddy (rice in husk), and clove fans. Tanjore.

Bombay Committee.

Fans (4), ornamented with peacock feathers. From Sawantwaree.

Fans (2).
Dinner mats (16).
Baskets and boxes (16).
} Made from the fragrant roots of the Khuskhus grass (Andropogon muricatum). From Sawantwaree.

Bengal Committee.

Ivory fan. From Sylhet.

Babu Sridhur Sahi, Zemindar of Maujha, Sarun district.

Fans (2). Ivory and sandal wood.
Fly-flappers (2). " Moorchul." Ivory and sandal wood.

Dr. Leitner, Lahore.

Three fans. One ivory, the second of sandal wood, the third of feathers.

India Museum, London.

Palmyra leaf shades (2). From Calcutta.

Edwin Ward, London.

Elephant hide walking-stick. Gold mounted.
Tiger claw riding whip (lady's).
Bear claw whip rack.

GROUP XI.—PAPER INDUSTRY AND STATIONERY.

A.—RAW MATERIALS FOR PAPER MANUFACTURE.

A large number of fibrous substances has from time to time and in different localities been applied in India to the manufacture of paper. Besides these a number have also been experimented upon at home. The supply of raw material for paper in India is almost without limit. The following collection from the India Museum, London, has been exhibited :—

Fibres for Paper Manufacture.

3,158. Puya bark. Bœhmeria puya.
3,196*a*. Nilgiri nettle. Urtica heterophylla.
Guatteria longifolia. Fibre.
3,198. Grewia. Fibre.
Morus indica. Fibre.
3,202. Guazuma tomentosa. Fibre.
Bauhinia purpurea. Fibre.
3,226. Musa paradisaica. Fibre and tow.
3,228. Musa textilis. Fibre and tow.
3,265. Yucca gloriosa. Fibre and tow.
3,142. Agave americana. Fibre and tow.
Broussonetia papyrifera. Bark.
Bhassaba paper. Raw material.
3,287. Shaw-nee. Burmah.
3,285. Shaw-young. Burmah.
3,286. Shaw-laybway. Burmah.
Gyeegywoh-shaw. Burmah.
Red bast of Pegu.
3,233. Pandanus odoratissimus. Fibre.
Old gunny. Punjab.
3,158. Bœhmeria puya. Tow and half stuff.
3,157. Bœhmeria nivea. Rheea tow.
3,165. Calotropis gigantea. Mudar tow.
3,174. Red jute tow.
3,174. Red jute. Half stuff.
3,174. White jute. Half stuff.
Hibiscus fibre. Half stuff.
3,196*a*. Urtica heterophylla. Tow.
Sterculia urens. Half stuff.
3,184*b*. Daphne cannabina. Pulp.
Bœhmeria sp. Half stuff.
3,179. Crotolaria juncea. Half stuff.
3,174. Corchorus capsularis. Half stuff.
3,204. Hibiscus cannabinus. Half stuff.
3,259. Urena lobata. Half stuff.
3,142. Agave americana. Half stuff.
3,146. Ananassa sativa. Half stuff.
3,226. Musa paradisaica. Half stuff.
Sanchi bark, for writing. 1st stage.
Sanchi bark, for writing. 2nd stage.
Sanchi bark, for writing. 3rd stage.
Sanchi bark, written upon.
Palm leaf, for writing.
Palm leaf, written upon.
Country reeds, for reed pens.

B.—PAPERS, MILLBOARDS, &c.

From India Museum, London.

Manufactured in Britain.*

Paper of Crotolaria juncea. Unsized and sized.
Paper of Agave americana. Unsized and sized.
Paper of Urena lobata. Unsized and sized.
Paper of Hibiscus cannabinus. Unsized and sized.
Paper of Corchorus olitorius. Unsized and sized.
Paper of Musa paradisiaca. Unsized and sized.
Paper of Agave americana. Unsized and sized.
Paper of Ananassa sativa. Unsized and sized.
Paper of wild rheea. Unsized and sized.

Paper from leaves of Pandanus odoratissimus.
Paper from plantain fibre. Made at Meerut jail.
Paper from gunny bags. Made at Cuddapah jail.
Paper from gunny bags. 2nd quality. Madras.
Paper from refuse gunny. Madras.
Paper from old gunny bags and fishing nets.
Paper from old gunny bags. Chingleput Jail.
Paper from old records. Meerut jail.
Paper from bamboo. Nepal frontier.
Paper from bamboo. Pegu.
Paper (large sheet) from Daphne cannabina. Nepal.

* Prepared under the direction of Mr. Wyndham Portal, at the Haverstoke Mills.

375. Paper used by the higher classes for letters of friendship. Lucknow.
374. Sprinkled paper used by the higher classes for letters of friendship. Lucknow.
349. Coloured paper for kites. Oude.
1,643. Strong packing paper, made from plantain fibre by steeping and rotting. Chingleput Jail.
1,643. Paper made from old jute ropes and string by the late C. V. Cunniah Chetty of Madras.
1,643. Paper made from plantain fibre cleaned by the paupers in the Monegar Choultry. Madras.
1,748. Gurchudni Malwi paper. Made at Indore.
1,745. Cheenee Malwi paper. Made at Indore.
1,750. Gold leaf sprinkled paper, for letter writing. Made at Indore.
1,751. Red sprinkled paper. Made at Indore.
1,749. Chini white paper. Indore.
1,747. White Gurchudni paper. Indore.
1,746. Mooraudshai paper. Indore.
1,643. Paper made from plantain fibre by paupers in the Monegar Choultry. Madras.
1,643. Paper made from fibre of Corchorus capsularis by paupers in the Monegar Choultry. Madras.

1,643. Paper made from jute by paupers in the Monegar Choultry. Madras.
1,643. Paper made from fibres of Agave americana by prisoners in the Chingleput Jail.
1,643. Paper made from mixture of Fourcroya gigantea fibre and cotton rags by prisoners in the Chingleput Jail.
1,643. Paper made from old cotton rags and white paper pulp by prisoners in the Chingleput Jail.
1,643. Paper made from old gunny bags by C. V. Cunniah Chetty of Madras.
1,643. Paper made from plantain fibre (badly cleaned) by the prisoners in the Chingleput Jail.
1,643. Paper made from mixture of Agave fibre and old cotton rags by paupers in the Monegar Choultry. Madras.
1,643. Paper made from old ropes and nets by the prisoners in the Chingleput Jail.
1,643. Paper made from the fibres of Fourcroya gigantea or gigantic Aloe by paupers in the Monegar Choultry. Madras.
353. Cheap wrapping paper. Made in Oudh.
364. Danapur arvali, first-class country paper for writing, made of old tow and flax. Oudh.
365. First-class country paper, "Hina Nandi Arvali," for writing purposes, made of old rope, of flax, and waste country paper. Oudh.
763. Paper, second quality, for writing upon. From the Punjab.
366. Arvali, country paper for writing purposes made of waste country paper. Oudh.
361. First-class country paper for writing, made of waste country paper only. Oudh.
358. Country paper for writing purposes, made from old tow. Oudh.
354. Country paper used in all offices for ordinary writing purposes. Oudh.
2,358. Second quality paper. From Berar.
2,356. First quality paper. From Berar.
2,357. Third quality paper. From Berar.
3,921. Paper made from refuse of Crotolaria juncea and Corchorus olitorius, mixed, and arseniated as a preservative against insects. Dinajepore.
3,920. Paper made from jute, Corchorus olitorius. Dinajepore.
363. Country paper, made of waste country paper, for writing upon. Oudh.
357. Inferior country paper made from old tow and old paper. From Oudh.
356. Inferior country paper for ordinary writing made of old tow. Oudh.
355. Inferior country paper, Rakimabad choti, for ordinary writing upon, made from old tow. Oudh.
362. Country paper, Rakimabad jaddi, for ordinary writing upon, made from old flax. Oudh.
359. Country paper, Rakimabad kitahi, for ordinary writing upon, made from old flax. Oudh.
354. First-quality paper for writing upon. Made at Lahore.
328. Second-quality paper for writing upon. Made at Lahore.
347. Third-quality paper. Made at Lahore.
328. First-quality paper for writing upon. Made at Lahore.
360. Middle-class country paper, made from flax, for writing purposes. Oudh.
393. Millboard, manufactured in the Presidency Jail. Calcutta.
3,826. Paper made from the bark of Broussonetia papyrifera, chiefly for making umbrellas. Rangoon.
755. Third quality coarse paper for wrapping purposes, made in the Punjab.
3,823. Paper made from the bark of Broussonetia papyrifera, used for packing. Rangoon.
3,824. Paper made from the bark of Broussonetia papyrifera, for writing upon. Rangoon.
3,825. Paper made from the bark of Broussonetia papyrifera. Rangoon.
367. Coloured paper for covering planks at marriage festivals, also for covers of jars of preserves. Lucknow.
761. Paper made at Srcenugger, and highly esteemed in Cashmere. From H.H. the Rajah of Cashmere.
370. Paper coloured and gilt for letters of invitation. Lucknow.
3,958. Arseniated paper, 90 years old. Bengal.
3,935–6. Paper made at Pooree Jail. Bengal.
4,264. Country paper (No. 1). From Furruckabad.
4,265–6. Country paper. Furruckabad.
4,271. Paper made of old cloth. Bareilly.
3,926. Country paper made at Behar.
4,267. Paper made from Plantain tree at Bareilly prison.
4,268. Paper made of Aloe root fibre. Bareilly.
4,269. Paper made of Gairoo and waste paper Bareilly Jail.
4,270. Paper made of Aloe fibre. Bareilly Jail.
3,929–3,930. Bhassaha paper made at Champarum.
3,916. Schuhubazar paper from Hooghly.
3,940. Paper made at Rungpore Jail.
761. Paper made in Cashmere, from H.H. the Rajah.
3,919. Doomerpore paper. Hooghly.
3,917. Schuhubazar paper. Hooghly.
3,914–3,915. Satgang paper. Hooghly.
3,918. Shuhubazar paper. Hooghly.
3,910–2. Mahanud paper. Hooghly
3,913. Satgang paper. Hooghly.
3,908–9. Arseniated paper made at Hooghly Jail.
3,947. Country paper. Behar.
3,948–9. Native made paper. Behar.
3,933. Paper made at Balasore Jail.
3,934. Paper made at Noakally Jail.
3,943. Arseniated paper made at Tipperah Jail.
3,941. Paper made at Bancoorah Jail.
3,942. White arseniated paper from Tipperah Jail.
3,944. Shantushi paper from Tipperah Jail.
3,945. Country paper from Tipperah Jail.
3,922–3. Bamboo paper. Dinagepore.
3,937. Country paper made at Cuttack Jail.
3,821. Book made of paper from Broussonetia papyrifera from Rangoon.
3,820 Book made of paper from Peepul tree, Ficus religiosa. Rangoon.
3,822. Book made of paper from Broussonetia papyrifera. Rangoon.
3,819. Book made of paper from Bamboo, for writing purposes. Rangoon.

Dr. Leitner, Lahore.

Specimens of Paper from the Punjab, &c.

GROUP XII.—GRAPHIC ARTS AND INDUSTRIAL DRAWING.

SECTION I.—BOOK, COPPER, STEEL-PLATE, AND MUSIC PRINTING; LITHOGRAPHY; CROMOGRAPHY.

Anniah Raj, Madras.

Lithographs (9), representing subjects in Hindoo theology, as follows:—

The god "Rama." The god "Parthasarathy." The god "Varatharajooloo." The goddess "Ahkilandeeswaree." The god "Maha Vishnu." The goddess "Lukshmee." The god "Soobramunya." The god "Runganatha." The god "Kishna."

K. J. Baldry, Superintendent, Government Lithographic press, Fort St. George.

Specimen plates (9) of various descriptions of lithography.

Specimen plate representing an improved "range finder."

Col. H. L. Thuiller, C. S. I., Surveyor-general of India, Calcutta.

Engraved on Copper in India.

Indian Atlas, quarter sheets, Nos. 10, S.E.; 10, S.W.; 51, S.E.; 87, S.W.; 125, S.E.; 125, S.W. 4 m. = 1 in.

Index to the Indian atlas.

Index to the great trigonometrical survey of India. 96 m. = 1 in.

Index chart to the great trigonometrical survey of India. 96 m. = 1 in.

Map of India, Nos. 1 and 2.

Lithographs.

Revenue survey district Gonda, province of Oude, on the scale of survey. 4 m. = 1 in.

The Punjab and its dependencies with portions of the North-Western Provinces and Afghanistan. 16 m. = 1 in.

Territory under the Lieutenant-governor of Bengal. 64 m. = 1 in.

Map of the North-Western Provinces. 32 m. = 1 in.

Map of Afghanistan. 16 m. = 1 in.

District Cachar and part of eastern frontier of Bengal. 4 m. = 1 in.

Oude Local Committee.

Lithographed books (6) and card.

SECTION III.—PHOTOGRAPHY.

Messrs. Nicholas and Curths, Madras.

Photographs (7), of the foliage of southern India, as follows:—

"Banyan trees" on Mowbray Road, Madras. "Palmyra trees" by the roadside. "Cocoanut palms." "Date palms." "A Banyan tree." "Well with Plantain palm trees." "Tree ferns."

Photographs illustrating various native classes, occupations, &c., as follows:—

"Native servants in an European household." "Native women at the curry-stone and raggi mill." "Native women pounding and cleaning rice." "Dursies" or tailors. "Native bill collectors." "An oil mill." "Native carpenters at work." "Native jugglers." "Dancing girls," "Pandarum with iron collar."

Photographs (15). "Carte de visite" size. Indian subjects.

Capt. Ross Thompson, R.E., Madras.

Photographs (14) of Indian scenery, &c., as follows:—

25. Traveller's Bungalow, Munghagherry, Kistnah District.

23. Pagoda Hill, Munghagherry, Kistnah District.

11. Old lime kiln, Quarry Hill, and Pagoda at Bezwada, Kistnah District.

101*a*. An avenue of "Dhoop" trees at Karkul, South Canara District.

102. Lake of Karkul, South Canara District.

103. Bungalow on the Kudray Mookh Hill, South Canara.

40. Captain Vibart's (R.E.) Bungalow at Dugiralla, Nazampatam canal, Kishna district, prior to Cyclone of 1864.

26. Master attendant's house and part of arsenal, Old Fort, Masulipatam, prior to cyclone of 1864, Kistnah District.

24. View from the traveller's bungalow, Munghagherry, Kistnah District.

62. View down the valley near the Zercana Lake, Shervaroy Hills, Salem District.

93. "Eadgah" and light-house at Mangalore, South Canara District.

100. The "Donkey's Ears" and Jain tombs at Moodbidrea, South Canara.

44. Old Banyan tree and little Mussulman mosque, Condapilly Hills, Kistnah District.

133. A bull bison shot at Charmady, South Canara, 18½ hands high.

Photographs (46) of Antiquities of India, namely:—

47. Old doorways in palace (Condapilly Hills, Kistnah District).

99. Entrance gate to a Jain temple at Moodbidry, South Canara District.

76. Porch of a Jain temple at Karkul, South Canara District.

76*d*. Tablet with old Canara inscription near the Karkul Jain temple, South Canara District.

76*e*. Carved pillars and verandah of a Jain temple at Karkul, South Canara District.

166. Entrance doorway to a Jain temple at Ariungady, South Canara District.

70. Carved pillar in the verandah of a Jain temple at Ariungady, South Canara District.
65. Basement and lower part of shaft of a Jain pillar at Ariungady, South Canara.
83. Jain pillar at Gooroovyankerry, South Canara District.
86. Jain temple at Gooroovyankerry, South Canara District.
139. Carved pillar in the Rajah's palace at Moodbidry, South Canara District.
146. Carved ceiling in verandah of a courtyard in the Moodbidry Rajah's palace, South Canara District.
141. Rear view of a Jain temple at Moodbidry, South Canara District.
136. Pillars in a Jain temple at Moodbidry, South Canara District.
164. A Jain pillar at Zainoor, South Canara District.
128. Doorway in a Jain temple at Zainoor, South Canara District.
76. A Jain temple at Karkul, South Canara District.
71. Pillar and part of ruined temple at Ariungady, South Canara District.
67. Porch of a Jain temple at Ariungady, South Canara.
65*e*. Carvings at base of a Jain pillar at Ariungady, South Canara.
84. Carved stones at Gooroovayenkerry, South Canara District.
81. Beltungady Bridge and the "Kudiray Mookh" Hill, South Canara.
138. Pillar in the Moodbidry Rajah's palace, South Canara, centre panel, a house composed of human female figures.
142. Entrance to a Jain temple at Moodbidry, South Canara.
135. Pillars in a Jain temple at Moodbidry, South Canara.
165. Porch of a Jain temple at Karkul, South Canara.
129. Front view of a Jain statue at Zainoor, South Canara.
126. A fine pillared temple at Gooroovayenkerry, South Canara.
72. A Jain temple at Ariungady, South Canara.
75. A Jain pillar at Karkul, South Canara.
69. Pillar in a Jain temple at Ariungady.
65*a*. A Jain pillar at Ariungady, South Canara.
78. Doorway in a Jain temple at Zainoor, South Canara.
85. A fine pillared temple at Gooroovayenkerry, South Canara.
137. Pillar in the Moodbidry Rajah's palace, centre panel represents an elephant composed of human female figures, South Canara.
54. Group of idols near traveller's bungalow at Kuringipady, South Arcot District.
76*b*. Doorway in a Jain temple at Karkul, South Canara District.
49. View of old palace, ruined gardens, fortifications, &c. (Condapilly Hills), Kistnah District.
22. Front view of the Munghagherry pagoda, Kistnah District.
88. The Kudiray temple at Mangalore, South Canara District.
74. A Jain statue at Karkul, South Canara District; the figure is more than 50 feet in height, and carved out of one stone. The basement is built.
143. Front view of a Jain temple at Moodbidry, South Canara.
167. Base of a pillar in a Jain temple at Moodbidry, South Canara.
183. A carved stone at Zainoor, South Canara District.
166. Base of a Jain pillar at Zainoor, South Canara District.
55. Old stone idol (the Belly God and his Mongoose) in the compound of the traveller's bungalow at Amapett, near Chellumbrum, South Arcot District.

Madras School of Arts.

Photographs (34) of Antiquities in Southern India, as follows:—

"Carved stone pillars at Terramungalum."
Carved stone pillars at Perroor.
Carved stone pillars at Howhoblam.
"Old palace at Chundragherry."
"Rock-cut temple at Salavankuppam."
"Right half of the dragon's cave at Salavankuppam."
"Old inscriptions in the cave temple at Salavankuppam."
"Stone figure of a female," found near Madras.
"Buddhist figure."
"Right half of the rock sculptures, Mahavellipooram."
"Stone ratha at Mahavellipooram."
"Three stone rathas at Mahavellipooram."
"Female figure from stone ratha at Mahavellipooram."
"Elephants, peacock, and monkey at Mahavellipooram."
"Right half of stone sculptures at Mahavellipoo ram."
"Left half of stone sculptures at Mahavellipooram."
"Cave temple at back of sculptured rock at Mahavellipooram."
"Sculptures at back of sculptured rock at Mahavellipooram."
"Carved figures from second stone ratha at Mahavellipooram."
Cave temple at the back of the sculptured rock, Mahavellipooram.
Sculptures at Mahavellipooram.
Cave temple to the south of the rock sculptures, Mahavellipooram.
"Stone ratha to the south of the rock sculptures, Mahavellipooram."
"Sculptures in cave temple, Mahavellipooram."
"An old stone ratha, Mahavellipooram."
"Rock sculptures, Mahavellipooram."
"Stone pagoda near the sea, Mahavellipooram."
"Rock-cut temple, Yemapooram, Mahavellipooram."
"Stone ratha below the rock sculptures, Mahavellipooram."
"Cave temple at end of rock sculptures, Mahavellipooram."
"Monkeys carved in stone, Mahavellipooram."

Captain Traill, R.E., Madras.

Photographs (14) of Antiquities of Southern India, as follows:—

Bailoor temple, interior shrine.
Bailoor carvings in inner temple.
Bailoor, image of Ganesa.
Somnathpore, east front of temple.
Somnathpore, carvings on temple.

Somnathpore, interior court of temple.
Hullabeed, general view, west face.
Hullabeed, carvings, west face.
Hullabeed, entrance, east face.
Seven pagodas, near Sadras.
Seven pagodas, carvings.
Hindoo temple, Bangalore.
Siringham, stone carvings.

D. H. Sykes, Bombay.

Photographs (2) of Ambarnath temple.
Photograph showing interior of Mandup, Ambarnath temple.
Photographs of river scenery, as follows:—
View down the Par River.
North side of Par River.
Remains of the Par Bridge.
Damaun Gunga, remains of Par Bridge.
Damaun Gunga, south side.

Shewshunker Narayen, Bombay.

Photographs (33) of Ambarnath Temple and its details, as follows:—

Decorated tank. Screen of decorated tank. Entrance to tank. North door. South door. West door. North-west corner. Ceiling in west doorway. Brahma. "Maha Kalee." Mahadeo. Suttee stones; dug up in 1869. Ruins of top of Vimanah. North face of Vimanah. East face of Vimanah. Todah Lake, Ambarnath Temple. Ruins, details, &c.

Ambarnath Temple, situated five miles from Callian, is a Ling Temple, on the banks of the Wadwan, a small stream which falls into the Oulas, running till February or March, and stagnant after that date until the rains (15th June). The tower or vermanah, now destroyed, was composed of two storeys. The hall, or mandap, is still covered, but all the terminations of the stonework have been thrown down; this part is still divided into two storeys, the lower carefully set out, sculptured richly in all its parts, the upper, plain, roughly put together, unfaced stones projecting everywhere, and for the most part composed of blocks taken from a former ruin. The construction of the dome differs from the rules elucidated by Mr. Fergusson in reference to the vaulting in Jain Temples in this respect, viz., that the upper part is closed by *two* stones meeting, and that a circular place has been cut out, through which the centre pendant is made to hang.

The interior of the vermanah, which is much below the surface of the ground and floor of the Mandap, is reached by a flight of steps.

The Ling, or God "Shámbhá," a most insignificant object, which projects merely a few inches from its surrounding "yonee," in the centre of the chamber, has been broken into many pieces by masses falling from above. There is nothing to prove that this was not the original stone over which this beautiful temple was raised by some devout worshipper. Under the west portico of the Mandap is a Nundee, or Sacred Bull, the usual vehicle or vehan of Mahadeva (Shiva); but there is no doubt that its present position is not the one originally occupied by it. It must have been either in the centre chamber, under the dome, or at a short distance outside facing the west entrance.

The compound surrounding the building is replete with carved ruins. Three flights of stairs, having sides elaborately sculptured, lead to higher ground, which was formerly built upon, and from which bricks of a large size are still recovered from heaps strewn about in abundance. A number of sculptured "Suttee" stones have been dug up from the earth near the south portico. These were erected to commemorate the self-sacrifice of Hindoo widows on the funeral pyre of their husbands. A richly sculptured tank of small dimensions, from which a small quantity of silver, copper, and lead coins were dug up, is reached by a flight of stairs on the south side. Cells seem to have been built in the S.W. and N. walls of the compound; and many works, some of great importance, have been constructed in the surrounding fields, such as a cutting through the rock for an artificial channel, the construction of a high dam, several hundred yards long, terminating in a deep reservoir, and very likely formerly communicating with a tank still in excellent state of preservation on the other side of the Wadwan. Vestiges of ruins here and there show that at some remote period this place must have been of great importance on account of its sanctity. The translations, made by Dr. Bhau Daji, of Bombay, of the inscriptions proves that the temple was rebuilt in the 9th century, the date being Samvat 782, corresponding with the year 860 of the Christian era. Many signs go to prove that a similar temple existed previous to the present one. The shaft of a column similar to the four central ones has been discovered, and many pieces of sculpture have been recut and fitted into their present places, while others show clearly that they have been cut partly away to fit. The upper storey of the Mandap is full of these remains; so also are the sides of the larger tank.

Col. H. L. Thuillier, C.S.I., Surveyor-General of India.

Photozincographs.

Central Provinces' Topographical Survey, sheet No. 7, portions of Hoshungabad and Baitool, 1 m. = 1 in.
Bundlekund Topographical Survey, sheet Nos 45. and 48, portions of Punnah Bijawar and Chuttlepore. 1 m. = 1 in.
Chota Nagpore Topographical Survey, sheet No, 64, portion of Sirgooja and Koria. 1 m. = 1 in.
Central Provinces' Topographical Survey, degree sheet No. 4, parts of Hoshungabad, Chindware, and Baitool. 4 m. = 1 in.
Central Provinces' Topographical Survey, degree sheet No. 4, with specimens of exaggerated drawing of hills and outline on blue prints for reduction to half scale.
Rajpootana Topographical Survey, degree sheet No. 5, parts of Jeypore and Ulwar. 4 m. = 1 in.
District Hazareebaugh, sheet No. 11, on the scale of publication. 1 m. = 1 in.
District Nimar, Central Provinces, with specimens of exaggerated original drawing on 4 times the scale. 4 m. = 1 in.
District Seonee, Central Provinces. 4 m. = 1 in.
Plan of the Cantonment and civil station of Mount Aboo, Rajpootana. 24 m. = 1 in.
Plan of the Hill Sanitarium of Cheerat, near Peshawur. 12 m. = 1 in.
Part of plan of the Sanitarium of Simla and Jutog, Northern India, sheet No. 4. 24 m. = 1 in.
Plan of the French Settlement of Chandernagore on the River Hooghly, near Calcutta. 16 m. = 1 in.,

Plan of the French Settlement of Chandernagore, on the River Hooghly, near Calcutta. 8 m. = 1 in.
Cachar and Lushai Hills with part of the Munipoor frontier, showing the operations of the left column, Lushai Expeditionary Force, 1871-72. 4 m. = 1 in.
Country adjoining the Chittagong Hill Tracts, embracing the field of operations of the right column, Lushai Expeditionary Force, 1871-72. 4 m. = 1 in.
Maps of country round Delhi, illustrating the Camp of Exercise, 1872. No. 1 showing the position of the standing camp. 2 m. = 1 in.
No. 2.—Reconnaissance of the country to the south of Delhi, embracing the ancient fortress of Toyluckabad, the Kutub, &c.
No. 3.—Reconnaissance of the country to the north of Delhi.
Country round Hussein Abdal (Punjaub, Northern India), comprising the field of operations of the Camp of Exercise, 1872-73. Printed on cloth. 1 m. = 1 in.
Country between Attock and Rawul Pindee, Punjaub, comprising the field of operations of the Camp of Exercise, 1872-73, enlarged twice and printed on cloth. 2 m. = 1 in.
Specimens of native handwriting.

Photocollotypes.

Reduction to half of quarter sheet 51, N.E. of the atlas of India. 8 m. = 1 in.
Reduction to three-fourths of quarter sheet 51, S.E. of the atlas of India. 6 m. = 1 in.
Silver-filagree rose-water bottle.
Sculpture from Cuttack.
Copy of drawing in Sepia.
Copy of drawing in Indian ink.
Lushai women and pipe.

Photographs.

Francesca di Rimini.
Triumph of Christianity over Paganism.
Sculpture in the caves of Cuttack (Khandagiri).
Lushai woman and pipe.
Lushai arms.
Photographs of Indian cloths ornamented with gold embroidery made at Benares.
Indian hookah.
Photographs of Indian jewellery, including bracelets, necklaces, necklets, ear ornaments, &c., as worn in Bengal.
Photographs of utensils and silver ornaments from Nepal, N. E. India.
Photographs of antique silver ornaments from Cuttack. Eastern India.
Photograph of silver-filagree box for holding betel, &c., made in Cuttack.
The Durbar held at Kutub in honour of Sir William Bentinck.

Dr. Leitner, Lahore.

Photographs of Buddhist Temple and Idol.
Photographs of members of tribes on and beyond Punjab frontier (chiefly done by Messrs. Burke and Baker); of Græco-buddhistic and other sculpture from Yusufzai and Swat.
Photograph of Lahore College.
Maps of India executed by the Trigonometrical Survey.

A set of excellent photographs have been sent by the Punjab committee, which were chiefly done by Messrs. Burke and Baker. These photographs are naturally a very valuable adjunct to the collection.

India Museum, London.

Specimens from a fac-simile of the Mahabhashya, a celebrated Sanskrit grammatical work, written by Patanjali, in the 2nd century B.C. Photolithographed by W. Griggs, Indian Museum, London.
Photographs from all parts of India (from the London Exhibition of 1871).

Bombay School of Art.

Ten photographs.

India Museum, London.

Collection of photographs by Capt W. Hooper and Surgeon G. Western. (From the London Exhibition of 1871).
Photographs of Hindu musicians, and of the principal musical instruments. (From the London Exhibition of 1872.)
Photographs of native jewellery. (1872 Exhibition.)
Photographs showing the mode in which native ornaments are worn. (1872 Exhibition.)
Views in Bombay. Photographed by Messrs. Sykes and Dwyur, Bombay, as follows:—
954. Banian tree and St. Mary's College. (From the London Exhibition of 1871.)
955. Colaba cotton green and fishing village of Worlee. (From the London Exhibition of 1871.)
956. Frere fountain. Designed by R. Norman Shaw, Esq., and executed by W. Forsyth, Esq. (From the London Exhibition of 1871.)
958. Cocoa-nut trees and Kewra bushes, and peepul tree. (From the London Exhibition of 1871.)
960. Arthur Crawford Market; and Khundalla from the Traveller's Bungalow. (From the London Exhibition of 1871.)
India views and landscape. Photographed by Messrs Bourne and Shepherd, Calcutta. (From the London Exhibition of 1871.)
724 (19). A "bit" on the new road. Rogi Himmalayas.
726 (21). Rocky Channel of the Ganges at Bhairamghati.
727 (22). View in Wanga valley. Himalayus.
729 (24). Rapids on the Pykara, below the bridge. Neilgherries, Madras.
740 (35). A quiet "bit" near the willow bund, Ootacamund.
741 (36). The lake sunset from the willow bund. Ootacamund, Neilgherries.
743 (38). A peep from near Bombay House. Ootacamund.
713 Picturesque view from Jakko, showing the Church, Simla.
715 The church, &c. from the club, Simla.
717 The Tara Devi and surrounding hills from Boileaugunge, Simla.
728 Chota Simla from Jakko.

711. Forest scene, with creepers, in the Tukvar Road, Darjeeling.
712. The Jumnootri Peak. 20,758 feet from the height above Barsoo, Bunderpoonch.
719. Snowy peaks near Gangootri, from Bhairamghati.
723. The view from the new road at Pangi. The great China peaks in the background.
733. Banian Tree in Barrackpore perk, interior view.
737, 738, 747. (3) Rustic scenes and village life in Bengal.

Collection of Photographs. by Messrs. Nicholas and Curks, Madras. (From the London Exhibition of 1871.)
Collection of Photographs (6). From Bombay. (From London Exhibition of 1871.)
Photographs (2). From Madras. (London Exhibition of 1871.)
View near Neil's Statue.
View near 1,000 lights. Mount road.

Bombay School of Art.
Collection of Photographs (10).

SECTION IV.—PATTERN DRAWING AND PAINTINGS FOR DECORATION.

India Museum, London.
Designs for textile fabrics collected by Dr. Anderson of the Yunan expedition in Sande Valley, 1868.

India Museum, London.
Sample books, containing actual specimens of Indian fabrics in cotton, silk, wool, gold and silver cloth,&c. Constituting portion of new work in the textile manufactures of India. Selected and prepared under the direction of Dr. J. Forbes Watson, reporter on the products of India.
Chromolithographs of Indian textile fabrics, prepared under the superintendence of Dr. J. Forbes Watson, by W. Griggs, India Museum, and forming portion of new work on the textile manufactures of India.

GROUP XIII.—GENERAL MACHINERY.

SECTION II.—MACHINES FOR WORKING SPECIAL KINDS OF MATERIAL (WITH THE EXCEPTION OF AGRICULTURAL MACHINES, WHICH ARE CLASSIFIED IN GROUP XIIIA).

Commissioner of Benares.
Model of a sugar mill.

Deputy Collector of Furruckabad.
Machinery and materials used in the distillation of country liquor :—
Stove. Copper boiler and vessel. Two boiler-covers (earthen). Tank. Tube.
Machinery and implements used in the manufacture of sugar :—
"Koloo," sugar cane press. Worked by a pair of bullocks.
"Kurhaie," iron pan or boiler, for boiling the cane-juice.
"Puttoona," wooden sugar-skimmer.
"Doohree," iron spoon, used for stirring the liquid when in the "Kurhaie," or boiling pan, also for ladling it out and removing it.
Cotton cleaner "Rehtee." Used for separating the cotton from the seed. The seed falls while the cotton passes cleaned between the two cylinders of and wood.
Implements used in the collection of crude opium :—
"Ankhee," an iron tool used for slitting the poppy capsules. The incessions are made in the afternoon, the juice exudes throughout the night and is scraped off next morning.
"Sippee," or "Puchunneea," iron tray in which the crude opium is collected as it is scraped off the capsules.
An oil mill.

SECTION IV.—STREET LOCOMOTIVES, AND OTHER MEANS OF TRANSPORT.

Madras Committee.
Photographs (4) of conveyances in use in Southern India :—
"Bullock Coach." "Rackla Gharry." "Muncheel." "Jutka."
Model of Madras Butler's cart with bullock. Madras.
Model of Palanquin. From Nursapore.
Model of "Moglai Gharry," with bullocks. Bellary.

Grand Arsenal, Madras.
Model of a hospital "Dhooly."
Model of Neilgherry "Muncheel."
Model of hospital "Muncheel."

Madras School of Arts.

Models of various conveyances, as follows :—

"Jutka." Hand truck. Water cart. Butler's cart and bullock. Country cart (bandy) and bullocks. Cart for bricks, &c. Moglai Gharry and bullocks.

Coopoosawmy and Co., Madras.

Models (4) of conveyances, &c. :—

"Tonjon." Hindoo marriage Palanquin. Mahomedan bier. Palanquin carriage, newest pattern.

Gun Carriage Manufactory, Madras.

Model of Palanquin coach.
Model of Hawker's cart.

Arsenal at Bangalore.

Model of Bangalore cart, with stone wheels.

Simpson and Co., Madras.

Model of travelling bullock coach, with bullocks.

Bombay Committee.

Model of bullock carriage. From Bhownuggur.

Bengal Committee.

Models of Vehicles, with wheels.

"Ekka" (2). From Patna, and Hajipore, Tirhoot District. The one-horse vehicle in common use by the natives of zillah Patna.
"Saggur." With bullocks and driver. From Nuddea, Ram Lal Pal, modeller. The common two-wheeled cart for the conveyance of heavy loads in Bengal.
Bullock cart. From Hajipore. Common cart used in Hajipore, subdivision of Tirhoot, and in Behar.
Two-wheeled "Saggur" (2). From Hooghly and Bancoorah. Peculiar for its solid wheels.
Two-wheeled "Saggur" (2). From Serampore, Hooghly District, and Gya.

Models of Vehicles, without wheels.

Buffalo cart. From Goalundo. Common buffalo cart without wheels used in the neighbourhood of Goalundo.
"Palki" (3). From Gya, Patna, and Bancoorah.
"Buradaree." From Gya. Used for the conveyance of a bride to and from the marriage ceremony.
"Myana." Gya. A kind of litter used in Gya.
"Doli." From Bogra. Litter in common use in Bogra, showing the curtain to protect the passengers from the sun, as well as to protect female passengers from public gaze.
"Katoli." Litter from Gya.
"Palki." From Serampore. The ordinary palki used in Serampore and throughout Lower Bengal.
Nalki (2). Patna and Hajipore. A litter used by the wealthy classes.
"Palki," with bearers, and passengers inside. From Nuddea, Juddonauth Pal, modeller. Showing the mode of travelling among the natives of Bengal and the position of the traveller inside.
"Chaudol" (2). From Balasore and Bancoorah. A litter for carrying idols about and for keeping them in when stationary.
"Mahapaya," or "Mahapa." From Balasore. A strongly-built litter used in Balasore instead of a palki.
"Thanjam," or "Tanjam." From Chittagong. A kind of sedan chair much used in Chittagong, but not for long journeys.
"Mahapaya." Bancoorah. Used in Bancoorah for the conveyance of females by the Mahomedans.
"Doli." Bancoorah. The common litter in use in the district of Bancoorah.
"Boncha palki." Bancoorah. A sort of sedan chair without hood in use in Bancoorah.

Bazonjee Munchurjee, Poonah.

A series of drawings of the carts in use in Western India. (From the India Museum, London.)

Many of these carts have been in use from time immemorial. They all agree in presenting the general feature of a platform, with or without sides, supported on two wheels.

The Poonah Satta and village Satta carts (drawings Nos. 3 and 9) are stated to be the oldest in existence. They are certainly very primitive in construction, more especially the latter one, which is roughly built of common jungle-wood, and furnished with stone wheels cut from the blue basalt of the Deccan. These wheels, which are said by the villagers to be cheaper than those of wood, are very liable to split, especially on stony ground, thus rendering the circumference very irregular and uneven, and interfering with locomotion. It is probably for this reason, and on account of the additional weight of such wheels, that buffaloes are made to draw these carts, instead of the comparatively weaker oxen generally employed for such purposes.

In the construction of the Poonah Satta carts, wood of the best quality, as teak or babool, and workmanship of unusual excellence, are made use of. The wheels (to which those of the Poonah Bundey and Poonah Bangree carts, Nos. 4 and 5, are very similar) consist of three blocks of teak or babool wood, bound together by an iron tire. The nave is lined with an iron ferrule, and convex plates of iron are bolted to each side of the wheel. The body of the cart is a simple platform without sides, supported partly by the axle-beam, partly by the poles. In the Poonah Bundey cart, No. 4, the platform is erected directly upon the poles, without the intervention of an axle-beam. In all other points, the construction of these carts (Nos. 3, 4, and 5) is similar to that of the Panwell Bundree and Poona Dumney carts, described hereafter.

Many of the carts shown in the drawings (*e.g.*, Nos. 3, 4, 5, 7, and 9) are provided with wooden axles, which, even if made of the hardest and toughest wood, are constantly breaking, especially on rough jungle roads. If, instead of a wooden axle, an iron one were used (as in Nos. 1, 2, 6, and 8), not only would the annual cost of repairs be much lessened, but the carts would also be rendered available for greatly increased loads.

Formerly the transportation of merchandise from the Deccan plateau, across the high chain of the Western Ghauts to the sea-coast, was a very arduous and difficult operation, the goods being conveyed up and down the mountain passes by means of coolies or oxen; but on the introduction of British power macadamized roads were constructed across the Ghauts, and a great impulse was consequently given to commerce in this part of India. The natives availed themselves to the utmost of the opportunities thus offered them, and many of the carts shown in the series were introduced at that time to meet the

increasing demand for improved means of conveyance.

A few particulars about the construction of these carts will be given here, not on account of their intrinsic importance, but rather to show the existence, among the natives of India, of a spirit of invention and enterprise which requires only favourable opportunities to develop itself.

The Panwell Bundree and Poona Dumney carts were invented and brought into use by a Brahmin, who opened manufactories at Panwell and Poona, from which towns these carts take their names. The following is an outline of their more important features:—The wheels, usually from 3½ to 4¼ feet in diameter, are spoked, and surrounded by an iron tire, additional support being given to the nave by iron ferrules, &c. Babool, teak, or other wood of good quality is used in the construction.

The axle is of iron and is connected with an axle tree and axle beam of ordinary jungle-wood, by means of iron straps and spikes. The poles and the framework or body of the cart are also made of jungle-wood. The former pass through the axle beam and unite in the centre of the yoke. The framework is supported partly by the poles and partly by the axle beam. The poles, axle beam, and frame are frequently made with the assistance of the village carpenter at the cost of about 10*s*., by the owners themselves from timber previously procured from the jungle. These carts are available for the conveyance of either agricultural produce or passengers; when used for the latter purpose the body of the cart is strewn with grass or straw; when loaded with cotton or hay the substance is piled up to a height of about four feet, and secured with ropes tied to the framework; when grain is about to be carried the cart is lined with split bamboo, covered, if necessary, with coarse cloth. During the hot or rainy season an awning composed of matting stretched over a bamboo framework is erected over the body of the cart. Under the poles, and behind the wheels, hang pieces of wood called "Dhecknies," used as breaks.

In the general principles of construction the Madras Bundey and the Jooneer Satta carts (Nos. 6 and 8) agree with the above description, with the exception that in the Madras Bundey cart, No. 6, the wheels are from 4¼ to 5 feet in diameter, and there is but one pole running the whole length of the cart. The carts shown in Drawings 3, 4, and 9 are used for the conveyance of agricultural produce. The Poonah Bangree cart, No. 5, is used exclusively for the conveyance of building materials. The cost of the greater number of the carts shown in the series varies from 3*l*. to 4*l*. 10*s*. (Rs. 30 to 45), and if kept repaired at an annual expenditure of from 4*s*. to 10*s*. they will last for about 12 years. The Poonah Satta cart, No. 3, from the good quality of the wood and workmanship employed in its construction, costs from 6*l*. to 7*l*. (Rs. 60 to 70), and, if repaired, lasts for about 20 years.

The oil used for lubricating the axles is kept in a hollow joint of bamboo, and costs about 10*s*. per annum.

The weight carried necessarily depends much on the character of the road to be travelled; but on ordinary Deccan roads and with two bullocks the load does not generally exceed 11 cwt; with four bullocks the weight may be nearly doubled.

The distance travelled per diem averages about 18 miles (8 koss).

Drawings Nos. 14 and 15 represent native carts used for the conveyance of passengers only. They are usually mounted upon springs and travel at the average rate of three miles an hour. Cost, from 4*l*. to 8*l*. (40 to 80 rupees).

All the carts mentioned in the above short abstract are more or less of native design and workmanship. In addition to these, there will be found in the series, drawings of conveyances and appliances, such as commissariat carts, water carts, wheel-barrows, &c., introduced into India by Europeans.

Madras Committee.

Silk looms (2). Tanjore.
Silk carpet loom. Tanjore.

Bengal Committee.

Models of native silk-reeling machine (2). Bogra.

GROUP XIIIA.—AGRICULTURAL MACHINERY.

Madras Committee.

Model of a "Peccotta" for drawing water from a well. From Madras.
Model of Coorg "cart without wheels." From Mercara. Instrument used for weeding. From Salem.
Various publications referring to forest and agricultural produce, namely:—
"Reports of the juries on the classes of the Madras Exhibition of Raw Products, Arts," &c. in 1857. Beddome's "Flora Sylvatica," parts 1 26 to (3 vols). "Reports of Collectors of the Madras Presidency on the Rotation of Crops," &c. &c. "Annual Report of Madras Forest Department, 1871."

J. H. Masters, Collector of Bellary.

Models (9) of various agricultural implements from Bellary, namely:—
Seed-drill (Gorru), plough (Madaka), hoes (Guntaka, Metla Guntaka, and Junta Guntaka), hatchet, sickle (Kodavali), small sickle (Kurchiga) and cart (Chevalu Bandy).

Madras School of Arts.

Models (12) of various agricultural and other implements, such as ploughs, harrows, drills for sowing, grass-rake, bill-hook, "Mamoty," linseed-oil-mill, and shepherd's crook.

Messrs. Nicholas and Curths, Madras.

Photograph of natives working a "Pecotta" for drawing water from a well.

Bombay Committee.

Collection of agricultural and other implements from all parts of the Bombay Presidency.

The collection includes:—

Models of ploughs (native name "Hul"), hoes, scythes (Daturdoo), rakes, weeding tools (Koolpee, &c.), seed drills, sickles, harrows, spades, &c. Models of various carts used in agricultural operations.

V. Fretwell, Khandeish.

Various agricultural implements from Khandeish, such as ploughs (Hul), rakes, bullock-hoes (Bukkur), grain drills, &c. &c.

Col. H. Ramsay, C.B., Commissioner of Kumaon.

Models of Agricultural Implements used in Kumaon, N.W. Provinces.

Ploughs (6). Native name, "Hul." Scale, about 1 inch=1 foot. Average price, about 4*s*. Made of hard wood, drawn by two bullocks, and driven by one man, who holds the handle fixed in the upright, by means of which, and by shifting the yoke backwards or forwards, he regulates the depth of furrow, which is not more than 6″ deep.

Clod crusher. Native name, "Dhelara." Price nominal. This mallet is generally used by women in breaking clods after ploughing.

Harrow. Native name, "Dhunyala." Price nominal. Used after grain is sown; drawn by two bullocks, and driven by one man.

Rollers (3). Native name, "Myra." Price nominal. Used after the harrow for smoothing the ground; drawn by two bullocks, and driven by one man, who sits on the block, the pegs in which are used for lifting it up when weeds collect.

Grubber. Native name, "Dhunela." Price about 3*s*. Drawn by two bullocks, and driven by one man. Prongs made of hard wood. Used for weeding and thinning out pulse and millet crops; also in making ridges for retaining water in rice fields. Hooks in transverse block made of wood, and used by the driver for lifting up the implement when clogged.

Hoe. Native name, "Kootla." Price about 9*d*. Used generally by women for planting out and weeding.

Axe. "Koolhari." Price about 1*s*.

Bill-hook. "Dhuranti." Price about 1*s*. Used in lopping branches of trees for fodder, cutting scrub, jungle, and grass, and for reaping.

Adze. "Basoola." Price about 1*s*. Used by the villagers (as well as by carpenters) in building their huts and making and repairing their implements. Many of the people make as well as repair the latter.

Sieve. "Soopa." Price under 2*d*. Used in winnowing grain, filling sacks, and for like purposes.

Water-mill. Native name, ordinary, "Punchukkee." Local name used by hill men, "Ghutt." Average price with one wheel, 65*l*., average price with two wheels, 80*l*. More or less, according to depth of excavation required by the nature of the ground.

In the "Bhabur," or waterless forest running along the foot of the Kumaon hills, cultivation is only possible by irrigation from masonry channels carried from the rivers as they leave the hills. In suitable places mills are built, of rubble masonry, with lime mortar, and sheet-iron roofing. The site is excavated at one side of the channel deep enough to give a sufficient fall to the water from the mill race; the expense water is then carried down till it runs into the main channel. The water shoot and wheel are made of jamun or sâl wood (being hard); the hopper of wicker-work. The plug on the left of the stones is used for adjusting the upper stone according as fine or coarse flour is required. The steps leading down into the mill are rendered necessary by the depressed situation of the mill.

The Bhabur extends for about 80 miles long, by an average breadth of 10 miles. In this tract, much of which is still under forest, there are 48 mills. They are leased by government every year, by auction, and yield from 30 to 100 per cent. on their cost. For 1873 the rents were leased for 2,350*l*. The miller is paid by receiving a tenth of what he grinds. When grain is dear his profits are great. The same plan of mill is universally used in the hills, but constructed by the people in a ruder and much cheaper form.

A mill works night and day, and one pair of stones will grind about two tons of grain in 24 hours.

Deputy Collector of Furruckabad, N. W. Provinces.

Collection of Ropes and other Objects used in Irrigation.

1. "Burt" or "Naree." Hempen rope. Generally about 30 feet long; it works over the drum (No. 3) fitted over the mouth of the well.
2. "Burt chirmee." Leather rope. Used for the same purpose as No. 1.
3. "Girri." A drum, fixed over the mouth of the well.
4. "Pool Bundhuneea." A thin rope used in the well bucket (No. 5).
5. "Pool." A leather bucket used in drawing water, worked with the burt (No. 1) by two bullocks and two men.
6. "Joongha." A rope for connecting the main burt with the Jooa (yoke).
7. "Paina." An iron spike used in driving bullocks when drawing water.
8. "Beree" or "Lehree." Basket made of bamboo work, used in watering fields from tanks. Worked by two men with ropes. This method is employed only when the water is below the level of the fields to be irrigated.

Collection of implements used in ploughing, threshing, and other agricultural operations.

1. "Hul." Plough. Made of wood.
2. "Jooa." The yoke used in ploughing.
3. "Kussee." Spades (iron). The phowra differs from the kussee only in having a larger surface of iron and broader edge.
4. "Phowra."
5. "Koodalee." Implement used in digging and trenching.
6. "Putela." Harrow (wood), used in levelling fields. After ploughing, the furrows are covered in, and the surface of the field smoothed with this implement.

7. "Maigaha." Rope fastened to the harrow (No. 6).
8. "Chonga" or "Bans." Tube made of bamboo-work; used in sowing fields. This is fixed at the end of the plough, and thus plouging and hand sowing are carried on simultaneously.
9. "Khoorpa." Iron instrument used in weeding fields and in cutting grass.
10. "Gurasee." Iron instrument used in cutting fodder, and in lopping and cutting boughs.
11. "Hunseea." A reaping sickle.
12. "Puchye." Used for stirring the corn while being threshed.
13. "Gindowur" or "Dawuree." Rope used in fastening bullocks when threshing. The bullocks are driven round and round, and so tread out the grain.
14, 15. "Pughya" and "Jota." Ropes used in harnessing bullocks for agricultural work.
16. "Owgie." Whip used in bullock driving.
17. "Pansee." Used in tying bundles of chopped straw or grass. Carried on the head, and in common use all over the country.

Models (2) of carts used in agricultural operations.

Models (3) of "Bukhurs." Weeding implements.

Col. Puckle, Mysore Commission.

"Négilu." Native plough. "Halubé." Root grubber.

"Kurige." Drill for sowing Rági. "Kunte." Weeding hoe.

Berar Local Committee.

"Tippan." Drill-plough. Used in sowing Jowaree (Sorghum vulgare).

"Bukkur." Surface plough, for preparing land.

GROUP XIV.

SECTION III.—SURGICAL INSTRUMENTS.

H.H. the First Prince of Travancore.

A set of ancient native surgical instruments, belonging to a native doctor at Travancore, and consisting of:—

1. "Tákayantram." Used in pulling out thorns, &c. imbedded in the flesh.
2. "Sambasam." Used in extracting diseased tissues from the eye, putrified flesh, and slough from ulcers.
3. "Arsòyantram." Used in Prolapsus Ani (? Fistula). The tube is introduced into the rectum and the intestinal protrusions falling into the tube through the clefts in the sides, are operated upon.
4. "Marsayantram." Used in fleshy growths in nostrils. The instrument is inserted into the nostril so as to support the prolapsus (? Polypus), which is then cut.
5. "Vastiyantram." Used for Clyster. The leather pipe is filled with the substance to be injected, and the point of the syringe being introduced into the rectum the contents are squeezed and propelled.
6. "Salaka." Used for removing cataracts. The trilateral end is introduced, and the operater holding the other gives it a twirling motion.
7. "Balisam." Used in ophthalmic operations. It is used in lifting up the diseased part to facilitate operation.

A set of ancient native surgical instruments, consisting of:—

A probe, a director, instruments (4), used for removing cataract from the eye, instrument for opening whitlows, pincers, lancets (2), instruments (2) used in examining blind piles, needles (2) used in sowing up wounds.

GROUP XV.—MUSICAL INSTRUMENTS.

M. R. Ry. A. Streenevasa Row, Deputy Collector of Tanjore.

Collection of 66 Native Musical Instruments from Tanjore.

Wind Instruments.

Nagasuram. Timiri Nagasuram. Ottu. Hanumanta Ottu. Timiri Ottu. Panchama Ottu. Ekkala. Tuttari. Davala Sankam. Tutti (2.) Pullangulal. Mukavinai. Papaninassam Magadi. Morasingu. Alguja, Kombu. Vanga. Tarai. Karna. Surna. Tota.

Instruments of Percussion.

Tavul. Odal. Sanna Odal. Davandai. Didukatti. Suriaprabhai. Chandrabhai. Talam. Setti Talam. Maddalam. Suddha Maddalam. Jayaganta. Gonthalam or Samble. Nagara. Danka. Dakora. Dolki. Kanaga Tappu. Jangi. Tapa. Dinki or Murpha. Doal. Viranam. Udduku. Pambai. Kudukuduppai. Samakalam. Tada Tappu. Kangâri. Chipla. Jalar. Bhagainai Talam. Kittari. Wood Tallam.

Stringed Instruments.

Sarangi. Sarbuth. Thamburu. Sittar. Antharninai. Kinnari. Thunthana. Smaramandalam. Vinai. Dapu (2.

Bengal Committee.

A Collection of Musical Instruments from the Sonthal Pergunnahs, as follows :—

Drums (2).
Two flutes.
A wooden instrument used by the Sonthals for beating time to their dance music.
The strings to which the circular pieces of wood are attached are drawn sharply upwards, the jerk producing a harsh percussive sound.
Saga. A rude instrument by which a harsh grating sound is produced by passing the notched stick rapidly backwards and forwards through the split bamboo.
Drum sticks.
Cymbals, a pair.
Cymbals, a pair.
Panjum. Anklets worn by Sonthali women when dancing.
Rings worn on the great toe by Sonthali women when dancing.
Rings worn on the second toe by Sonthali women when dancing.
Ring worn on the third toe by Sonthali women when dancing.
These are worn more to produce a clinking sound during the dancing than as personal ornaments. They have accordingly been placed in this Group rather than in Group VII.
Ornaments worn round the ankles by drummers.
Ornaments worn by drummers round the arm.
Waist belts worn by Sonthal drummers.

Musical Instruments from the Garro Hills.

Dama - - - } Varieties of drums.
Khran - - - }
Nadek - - - }
Dakudara - - - } Varieties of flutes.
Banshi - - - }
Umbangi - - - }

War trumpets, "Ran Singha." From Chandrakona, Midnapore district.
It is said that Chundrakona is the only place where these instruments can be well made, and orders are sent there from other parts of the country. The instruments are much used in Vaishnava religious processions (Sankirton).
Drum. "Dholuck." From Chittagong.
A Kooki musical instrument. From Cachar.
In common use among the Kookis, something like a "bag pipe."
A pair of "mandiras," from Calcutta.
Cymbal-like in form, but used like bells as ringing instruments.

Suklul and Purushottum, Dacca.

Sitar.
Esraj with bow.
Tanpura.
Sarungi. A violin with bow.
Made by the exhibitors, who are celebrated manufacturers, both father and son.

Bengal Committee.

A Collection of Musical Instruments from the London Exhibition of 1872.

The collection includes the following :—

3,975. "Dotara." From Dingepore.
4,814. "Mughi Kara" (small drum). From Chittagong.
4,815. "Mingao." Chittagong.
4,816. "Sharinda." Chittagong.
4,817. "Shanai." Chittagong.
5,818, 4,819. Flutes (2). Chittagong.
4,813. "Mughi Kara" (large drum). Chittagong.
4,835. "Sitar." From Jessore.
4,836. "Taus." From Bancoorah.

Maharani Surnanaye.

Collection of Musical Instruments from Moorshedabad.

(From the London Exhibition of 1872.)

3,980. "Khunjuri."
3,982. "Churh" or bow.
3,977. "Tablah" (2 parts).
3,978. "Dhalak."
3,979. "Mridangah," or "Kale."
3,983. "Sarindah" and "Churh."
4,386. "Khareduck bome."
4,398. "Singeh."

Rajah Jolindro Mohun Tagore, Bahadur.

Collection of Musical Instruments from the London Exhibition of 1872, as follows :—

3,984. "Vina."
3,986. "Tritantar Vina."
3,990. "Saringara."
3,992. "Sura Sha."
3,993. "Sarinda."
3,998. "Ektara."
3,991. "Alaha saringi."
4,006. "Tasha."
4,008. "Hurook."
4,010. Dambara.
4,011. Dara.
4,012. Jhagi Khangani.
4,013. Khungani.
4,014. Ananda Sahari.
4,015. Gopi-jantra.
4,385. Khareduck jil.
4,412. Jara senai.
4,413. "Algaza" or "Maruli."
4,415. Loy Bansi.
4,416. Kalum.
4,418. Toobree.
3,987. Kinnari or Panjani Vina.
3,989. Sur Sringara.
3,994. Shorud.
3,999. Shara Vina.
4,000. Taush.
4,388. Kara.
4,389. Nagara.
4,390. ———
4,007. Madal.
4,387. Jai Dhale.
4,394. Dholoka.
4,397. Mridangah.
3,996. Esrar.
3,997. Tambura.
4,004. ———
4,005. Jaga Jampa.
4,384. Dhole.
4,391. Jore ghie (2 parts).
4,392. Magara Jil.
4,393. Magara Bome.
4,396. Daph.
4,001. Bipanchi Vina.

4,002. "Mizraps" (4). Worn on the finger when playing the setar or vina.
4,003. Wooden pins (7). Used for playing the "shorud" and similar stringed instruments.
4,009. Khole.
4,395. Damama.
4,399. Mandira.
4,400. Kartal.
4,401. Ram Kartala.
4,403. Kansore.
4,404. Ghanta.
4,405. Ghari.
4,417. Sankha.
4,419. Muchanga.
4,406. Katta.
4,407. Napoor (pair).
4,408. Ghungoor (a pair).
4,410. Tota Senai.
4,411. Bangal Senai.
4,409. Sanai.

Rajah Chandranath Rai, Bahadur.

Collection of Musical Instruments (from the London Exhibition of 1872) from Nattore :—

4,831. Khangani.
4,834. Kath Bomsi (Indian flageolet).
4,822. Bahina.
4,829. Sitar.
4,830. Tampura.
4,820. Dholak.
4,821. Dahina.
4,823. Kartal (a pair).
4,824. Khantal (a pair).
4,827. Napoor (a pair).
4,828. Gunguan (a pair).
4,832. Senai (Indian pipe).

H. Woodrow.

4,849. "Tocla." From Calcutta.

Dr. Leitner, Lahore.

A Panjab wire musical instrument made with the figure head of a peacock, after which it is called (Taûs).
A Panjab string instrument resting on two lacquered gourds, called the Bîn.
A Kashmîri guitar, Yarkandi, Tibetan, and Dardu flutes, &c.
A Burma gong and striker (wrapped round with cotton ropes). Is a very pure and long sounding bell.

Attention is drawn to the numerous flutes and pipes of Zanskar (Tibet), Ladak and Dardistan as well as to the double pipe which constitutes the Yarkandi flute. The gong in the collection is an excellent specimen of bell metal manufacture.

Mysore Local Committee.

Musical instrument. "Vine."
Coils of steel wire. Used in the manufacture of stringed instruments.

Indore Local Committee.

Musical instruments. Used by Bheels.

Bhopawur Pul Agency.

Kettle drum. "Kundi." Earthen vessel covered with goat skin.
Drum. "Dhol." Hollowed "Sewan" tree, covered goat skin.
Bamboo flute. "Pawa."
Metal dish. "Kase Kithali." Struck with stick.

GROUP XVI.—THE ART OF WAR.

SECTION I.—EQUIPMENT OF TROOPS.

Commissary of Ordnance, Cawnpore.
Complete sets of harness for cavalry, artillery, &c.
(For details, *see* Group VI., Section II.)

GROUP XVII.—THE NAVY.

SECTION I.—NAVAL ARCHITECTURE AND EQUIPMENT.

Madras Committee.

Model of a Masullah boat. Madras.
Catamaran (model). Madras.
Kistna Palmyra boat (model). Madras.

Messrs. Nicholas and Curths, Madras.

Photograph. "Catamaran starting to sea."
Photograph. "Budgerows" and "top boats" on Cochrane's canal, Madras.

Bengal Committee.

Collection of models of boats, as follows :—
"Gharnai." From Gya. A kind of raft for fishing. Used in Gya.
"Khunda." From Goalundo. Made out of the solid trunk of a tree. Used in shallow water.
"Pansi" or "budgerow." From Dacca. A large kind of pansi or dingi. Generally used as a passenger boat.

"Bhur" boat. Dacca. A boat for heavy coarse cargo.
"Sonamukhi," golden faced. Dacca. A description of the kind of boat called chhip; gets its name from the prow being ornamented with gilding. Used for quick travelling.
"Mayur panki," or peacock boat. Dacca. Another description of the chhip. Its make explains its name. Used similar to No. 5.
"Chhip." From Dacca. A narrow elongated pansi, common in Moorshedabad. Has generally 10 to 20 rowers. Used for quick travelling.
"Dingi." From Serampore. The ordinary kind of dingi. Used in the rivers of Bengal.
"Madh." From Chittagong. A float made of bamboo and cane. Used about Chittagong.
"Kheya dingi," or ferry boat. Chittagong. A kind of dingi used as a ferry boat about Chittagong.
"Hudi," or Ulak boat. Chittagong. Used on the coast about Chittagong.
"Dingi-sharunga." Chittagong. A dug-out converted into a dingi, and used as a ferry boat about Chittagong.
"Chhot," or Balam boat. Chittagong. Used as a passenger boat in deep water. Has generally two or three cabins.
"Nauka." From Bancoorah. The common boat for carrying produce in the district of Bancoorah.
"Donga" (double). Bancoorah. Two dug-outs joined together for the purpose of making a safe ferry boat.
"Bhela." Bancoorah. A raft or float made from the pith of the sola plant (Œschynomene paludosa). Used for fishing or for crossing rivers in flood.
"Bhela." Bogra. Differs from the preceding one in shape only. Used for fishing.
"Shalti." A dug-out. Singbhum. Used on the river of the south-western frontier.
"Telodonga." Serampore. A dug-out formed out of the trunk of the Borassus flabelliformis. Used for navigating shallow drains and water-courses.
"Jele dingi." Serampore. The boat commonly used by fishermen on the Gangetic rivers.
"Ulak." From Patna. The kind of boat used on the Gangetic rivers for carrying country produce.
"Chari." Nattore, Rajshahye district. An earthen tub used as a boat.
"Vewa." Jessore. A raft made of three or more plantain trees, secured by pieces of bamboo run through and through.

GROUP XVIII.—CIVIL ENGINEERING, PUBLIC WORKS, AND ARCHITECTURE.

Government C. E. College, Madras.

Model of Madras native sluice, for drawing off water from tanks at different levels.
Model of "Calingula," used to regulate the overflow of water from tanks, &c.
Section of Dam (model). Kistnah River Anicut.
Section of Dam (model). Godavery River Anicut.
Model showing the method of making terraced roofs in Madras.

Messrs. Nicholas and Curths, Madras.

Photographs of the bridge over the Toongaboodra River, North-west Line, Madras Railway:—
1. Photographic panorama of the bridge.
2. Photograph, showing the masonry of one of piers.
3. Photograph of the bridge from a close point of view.

Photographic views from Madras:—
The Government House.
The General Hospital.
The Presidency College.
Central Railway Station.
Napier Bridge over the Cooum.
The Pier.

Captain Ross Thompson, R.E.

Photographs (38) of subjects connected with Civil Engineering, Public Works, &c.:—
1. Town of Bezwada, Kistnah River and Anicut from Colonel Orr's house.
2. Kistnah Anicut and Government Workshops from Bezwada quarries, Seetanagram hill in distance.
5. Silt Trap at entrance to Lock Chamber, Bezwada, "Lock Hall," &c., in background.
15. Bridge over Ellore Canal near Bezwada, Native Transit boat and passengers.
4. Bridge over head of Canal at Bezwada, Government workshops, quarries, and old pagoda in background.
19. Little Channel Steamer, native huts, &c. in Bezwada.
13. Head of Ellore and Masulipatam Canals, Bezwada Cotton Boats, and "Shoe Dhonies" in foreground.
16. Junction of Ellore and Masulipatam Canals near Bezwada, Colonel Orr's house and Missionary's Bungalow in background.
12. Coolies trucking stone for the Kistnah Anicut, Public Works Department Library in background.
14. View from Quarries at Seetanagram on the Kistnah, Guntoor road leading over Nizampatam Canal Head Sluices.
3. Kistnah Anicut from Seetanagram Quarries, Under Sluices and Tramway in foreground, Bezwada Town and hills in distance.
36. Lock and Lock bridge at Dugiralla, Kistnah District, Iron stone-boats passing through (Nizampatam Canal).
33. Kunkipaud Lock (Masulipatam Canal, Kistnah District). View of the upper or Bezwada Reach, Bezwada hills in distance.
41. Aqueduct for passing the Cummamoor Channel over the Nuckoovagoo drainage, Kistnah District.
32. Aqueduct for passing Ellore Canal over the Zummelair River, Kistnah.

28. Tidal Lock Chamber. Dhonies passing up from the sea, Old Fort, Masulipatam, Kistnah District (taken prior to the Cyclone of November 1864).
60. Lower Coleroon Anicut, Tanjore District, showing the breach of 1864 under repair.
18. Grinding Chunam for the Kistnah Anicut at Bezwada.
7. Quarries for Kistnah Anicut at Seetanagram.
9. Entrance Lock and Head Sluices, Nizampatam Canal, Bezwada Hills in distance, Kistnah District.
39. Coolies filling Chunam kiln near Dugiralla, Iron Stone-boats, Nizampatam Canal, Kistnah District.
34. Nidamale Lock and Calingula (Masulipatam Canal), Kistnah District.
42. Forest View of Calingula of the Nullamada drainage, showing method of lifting Shullers, Nizampatam Canal, Kistnah District.
30. Ellore Lock at the junction of the Godavery and Kistnah waters, Ellore.
46. Ruin of old Palace, Condapilly hills, Kistnah District.
28. Tidal Lock Chamber, Old Fort, Masulipatam, Boats passing up from the Sea.
6. Scouring Sluices, Kistnah Anicut, Bezwada Side, Kistnah District.
17. View up Bezwada Canal from near the Swimming Bath, Bezwada, Kistnah District.
10. View down the Nizampatam Canal at Seetanagram, Kistnah District.
8. Head Sluices, Nizampatam Canal, River Kistnah in background, Kistnah District.
37. Irrigation Sluices at Dugiralla for distributing water at three different levels, Nizampatam Canal, Kistnah District.
35. Calingula for surplus water at Kunkipaud, Masulipatam Canal, Kistnah District.
43. Rear view of Calingula for the escape of the Nullamadda drainage, Nizampatam Canal, Kistnah District.
29. Iron lattice Girder Bridge over the Canal at Ellore, Kistnah District.
27. Tidal Lock Chamber, Custom House, &c., Old Fort, Masulipatam Canal, Kistnah District, prior to Cyclone of 1864.
59. Lower Anicut on the Coleroon River, South branch, Breach of 1864 under repair, Tanjore District.
52. Vellaur Anicut, rear view, South Arcot District.

R. S. Baldry, Superintendent Government Lithographic Press, Fort St. George.

Mounted photographs of subject connected with the Department of Public Works, India (2 sets).

Public Works Department, Bengal.

Sample bricks (6), from the Government Brick Factory at Acra.

The following information, concerning the manufacture of bricks and soorkey at Acra, has been furnished by H. Dewes, Esq., C.E., the Executive Engineer of the Acra Division :—

Immediately after the rainy season is over, that is in September and October, the earth is dug and thrown into heaps in places convenient for pugging and moulding. The earth is then pugged in pug-mills, and carried to the tables, moulded in iron moulds, and the bricks thus moulded are taken to the "hack" or drying ground, and afterwards "skintled." The bricks when dry in hacks are set in clamps and fired. The bricks are burnt in open clamps with coal.

The sizes of clamps vary from 50 feet square to 70 feet square, the general size being 60 feet square at the base, and contains about 550,000 bricks. A 60×60 clamp takes about three months to burn and cool. The rates of manufacture at Acra are given in the statement shown below. The men employed at the Acra brick factory are principally from the provinces of Orissa and Behar of the Bengal Presidency; very few from Bengal Proper. A good moulder will mould from 2,000 to 2,500 bricks daily; some few will turn out as many as 3,000 daily.

Rates at which Bricks are manufactured at Acra :—

Description of Work.	Rate per 1,000 bricks.	Remarks.
	Rs. A. P.	
Earth digging - - -	0 6 6	Varies according to lead.
Pugging - - - -	0 4 0	
Moulding - - - -	1 4 0	
Sand supplying - - -	0 1 0	
Skintling - - - -	0 1 0	
Setting in clamps - - -	0 13 0	
Fuel coal, at 7 maunds per 1,000 bricks - - - -	2 0 0	
Firewood for live holes - -	0 2 0	
Unloading and sorting - -	0 4 0	
Work, establishment, petty charges, &c. - - -	0 9 0	
Total per 1,000 bricks -	5 12 6	
Out-turn.		
70 per cent. of building bricks.		
10 per cent. of brickbats for soorkey and metal for road.		
10 per cent. under-burnt bricks	- - -	These under-burnt bricks are used in making foundation and casing of clamp.
10 per cent. waste.		
100		

Specimen of "Soorkey" (brick dust).

Soorkey is used instead of sand to mix with lime to form mortar. The broken bricks or bats from out-turn of clamps are conveyed by tramway, in trucks drawn by bullocks to the site of the soorkey manufacture shed, and there crushed by rollers worked by steam-power. The cost of manufacturing the soorkey per 100 cubic feet is about Rs. 9 including the cost of bats, or Rs. 3 exclusive of bats.

32,000,000 of bricks have been turned out at the factory in one season, but the present yearly out-turn of materials is about 20,000,000 of well burnt bricks, and 300,000 cubic feet of soorkey, chiefly for Government works in Calcutta and neighbourhood.

C. Fouracres, C.E., Executive Engineer, Dehree Workshop Division, Public Works Department, Bengal, Irrigation Branch.

Model of the Sone anicut, head-lock, under sluices, head sluice, and half of the centre sluices. This model shows half of the head-works on the left bank of the river; the other half is exactly the same. The different parts of the head-works models are numbered so as to fit together thus: the arrangement of sluice gates opposite the centre sluices; the oblong foundation blocks, scaffolding, windlasses, and shallow-well excavator, opposite the anicut; the deep-well excavator and round well opposite the under sluices.

Model of the under-sluice gates and plan of excavators.
Model of the oblong wells, scaffolding, and shallow-well excavator.
Model of the round-well and deep-well excavator.
Drawings (4 sheets) illustrating the construction and the working of Fouracre's various excavators.

The methods of working Fouracres's various excavators are thus described by their inventor :—

The action of the shallow well or block excavator is very simple. It is slung over the well or place to be excavated or to be sunk by tackle and pulleys worked by a windlass, or any other winding apparatus, from any convenient form of staging or from a boat, barge, flat, or pontoon. If used for deepening channels, rivers, reservoirs, or harbours, it is lowered with the jaws in the open position till it rests on the bottom, the attendants (one or two) step on the platform, and one with his feet releases the spring-crank or catch. The windlass men at once wind up; but the weight of the men keeps the connecting rod and scoop from rising till the jaws have closed; it is then full of sand, gravel, mud, or other soil; then all rise together. The two men step off on the sides of the well or platform, and a full bucket rises to the level. They sway it over the sides of the well or place being excavated, on a platform, point, or otherwise at the side of the well or place being excavated, and pull smartly at the lever, the jaws open, and the crank-catch holds them so, the sand, mud, or soil falls out, and the apparatus is then ready for lowering again and in its proper position to bite another load.

Fouracre's excavator for stiff soil.—This excavator is lowered into the well in the open position by the rope attached to the ram, as shown in the drawing. When the machine reaches the ground the ram descends to the "top collar," the chain that suspends the spear or central rod of the machine is kept moderately tight to keep the machine vertical; the ram is then worked similar to the monkey of a pile-driver until the claws have closed; it is then drawn up with its load. In case it brings no load with it, it can be lowered several times to break up the soil, and then any of the other excavators can be lowered to bring up the excavated soil. This machine acts like a pickaxe for the other machine.

Fouracre's deep-well excavator.—The deep-well excavator is very simple. It is lowered into the well or place to be excavated by a chain or rope over a pulley attached to a staging with a ridge-pole, and drawn up by men with or without windlass. It is lowered into the well open, and the hook attached to the pulley pin is put into the hole in the end of one of the scoops, the men wind or pull up a few inches; the hook then takes the strain brought on it and keeps the jaws open until it touches the ground; the strain is thus taken off the hook, and it drops out of gear. The excavator is then drawn up, the jaws closing and filling before they leave the soil. Weights are attached to make the jaws take the ground and fill better in hard soil, but they can be dispensed with in light soft soil. On the machine rising to the top of the well another chain, having previously been adjusted to the proper length, is hooked on to the top hook of the collar, the hoisting chain is then paid out a little, and the excavator swings to the side, opens its jaws, and discharges its load. The attendant will then put the hook out of gear and hoist the machine a few inches to relieve it from the chain adjusted to open it; it is then ready to be lowered again to bite another load.

It can be lowered 45 feet in a well and will bring up a load 38 times in one hour by manual labour. By steam power I have had no experience with it. It can be worked to any depth, and is considered the best excavator in use in India.

Extract from a report on foundation block sinking, by Mr. G. R. Long, Executive Engineer, Dehree Division, dated 13th June 1870.

	RS.	A.	P.
Cost of sinking 1,000 cubic feet of masonry by Mr. Fouracres's excavator; time three days - - - -	7	11	3
Ditto by Jham and Diver, native method; time 26 days - - - - -	63	9	0
Ditto by ditto as per Captain Goodwyn's rate - - - - - -	37	9	0
Ditto at Mohun Bridge, Grand Trunk Road, in the same district - -	225	2	6
Ditto at Putroo Bridge - - -	148	2	5
Ditto at Rahary Bridge with the sand pump - - - - - -	65	13	11
Ditto from Captain Cautley's Roorkey Manual of Well sinking - -	72	10	6
Average cost of the above method -	102	2	7
Average cost by "Fouracres's Excavator" for a period of three seasons, working on the River Sone, anicut foundation	7	11	3
Cost of one excavator - - -	30	0	0

G. H. Faulkner, C.E., Executive Engineer, Cuttack Workshop Division, Public Works Department, Bengal, Irrigation Branch.

A series of drawings of machinery, &c. connected with the Orissa Irrigation Works.
G. H. Faulkner's "A" strut and sensitive catch for back shutters of Pattia Weir, $\frac{1}{2}$ size.
Explanatory diagrams of the working of double shutters, scale $\frac{3}{8}$ in. = 1 ft.
Side under-sluice shutters for Juggutpore-Beropa anicut, and side sluice for Mahanuddy anicut, designed by G. H. Faulkner, scale $\frac{1}{2}$ in. = 1 ft.
Calingalah bridge for Somepore, Taldunda Canal, Mahanuddy, $\frac{1}{2}$ in. = 1 ft.
Calingalah bridge for Somepore, Taldunda Canal, Mahanuddy, $\frac{1}{4}$ in. = 1 ft.
G. H. Faulkner's equilibrium culvert sluice valve for lift locks, 1 in. = 1 ft.
Plan of upper lock gates and lifting gear for Somepore, Mahanuddy division, 1 in. = 1 ft.
E. I. I. & C. Co.'s No. 3 lock, Kendraparra Canal, upper gates, 1 in. = 1 ft.
No. 3 G. H. Faulkner's patent equilibrium culvert valve, $1\frac{1}{4}$ in. = 1 ft.
E. I. I. & C. Co.'s lifting gear for lock gates, designed by G. H. Faulkner, 4 in. = 1 ft.
G. H. Faulkner's patent "Ekdum" valve, 1 in. = 1 ft.
Head-lock gate, Jobra, with G. H. Faulkner's patent balanced valve, 1 in. = 1 ft.
Bridge over tail bay of lock, Kendraparra Canal, designed by G. H. Faulkner, 1 in. = 1 ft.
Bridge over tail bay of No. 1 lock, Mahanuddy, designed by G. H. Faulkner and R. Nunn, 1 in. = 1 ft.
Model of G. H. Faulkner's patent vertical face valve with inclined rails.

N.W. Provinces Local Committee.

A collection of photographs (300) of public buildings, architectural ornaments, &c. From Agra.

Dr. Leitner, Lahore.

Casts in mud of statues, and then coloured blue or bronzed. These were done on original statues, either in the Lahore Museum or in Dr. Leitner's collection, by a native, a perfect master of that form of casting, which certainly is quicker and cheaper, if not so accurate, as casting in gypsum.

Central Provinces Committee.

Various building stones (40 specimens) obtainable in the Central Provinces.
Specimens of slate, from Jabalpur quarry.
Specimens of limestone.

India Museum, London.

Photographs of bridges and stations on the East Indian Railway.

GROUP XIX.—THE PRIVATE DWELLING-HOUSE, ITS INNER ARRANGEMENT AND DECORATION.

Bengal Committee.

Model of a *pucka* bungalow, with fittings and furniture complete. The ordinary form of house used by English residents in the Bengal "mofussil."

Dr. Leitner, Lahore.

Interior of a Lahore house (Dhyan Singh's haveili), which was used as a college.

GROUP XXIII.—ART APPLIED TO RELIGION.

Bengal Committee.

A Series of Religious Paintings on Mats. From Puri (Jagganath) Orissa.

The procession of the Car of Jagannath (the idol with the black-daubed-face is Jagannath).
The three car figures surrounded by various personages of the Hindu mythology Jagannath, Subhadrá, and Balabhadra.
Hanuman and Jamboman, a picture from the Ramayan.
Æsthetic Fetishism.
Jagannath, Subhadrá, and Balabhadra in their cars.
Jagannath and Balabhadra bound for warfare.
The three car figures surrounded by characters from the Ramayan.
Jagannath, Balabhadra, and Subhadrá.
Jagannath, Balabhadra, and Subhadrá.
The car of Jagannath dragged by the monkey god Hanuman.
Jagannath, Balabhadra, and Subhadrá.
Jagannath, Balabhadra, and Subhadrá in a temple, with figures from Remenza above and around.
Jagannath, Balabhadra, and Subhadrá.
Jagannath, Balabhadra, and Subhadrá, with the four-headed Brahma on one side, and Siva with a snake over his head, on the other.
A charioteer dragging the car of Jagannath. The horse (or rather fanciful chimea) is crushing an elephant.
Jagannath, Balabhadra, and Subhadrá.
Jaghannath (with his two fellow deities) in his car, with Siva (snake-crowned) to the left, and Brahma (four-headed) to the right.
Jagannath and his fellow deities.
These pictures are purchased by the pilgrims to the shrine of Jagannath and cherished by them as souvenirs of their holy toils. They are painted in varnish colour upon a kind of mat composed of rags thickly pasted together. The subjects are generally illustrative of the great idol worship of Jagannath, though other themes drawn from Hindu mythology are occasionally depicted.
One very favourite series of subjects is the illustration of the various modes in which the Jagannath idol is clothed and decorated for the different festivals. The making of these rag-mat pictures gives employment to about fifty men in Puri. The prices for these pictures range from an anna to a rupee, according to their size. It will be seen that the representation of the three car figures is an extremely favourite subject. The pictures are varied by the introduction of the different personages of the Hindu Pantheon, characters from the Ramayana, &c. In the pictures of Jagannath, Balabhadra, and Subhadrá, the former is always represented black and Balabhadra white. Subhadrá is always placed in the middle, supported on the right and left by the two others.

A Series of Stone Carvings of Idols. From Puri (Jaganath) Orissa.

Narsing, the fourth Avatar or incarnation of Vishnu.
Hanuman.
Autna Gopal (an idol).
Jagannath, Balabhadra, and Subhadrá.
Vamana, the fifth Avatar or incarnation of Vishnu.
Balmakund, or Krishna in his infancy.
Ganesa.
Durga killing the Asura.
Krishna Radha.
Mahadeva with his Bull Nandi.
Lakshmi.
These carvings, like the foregoing pictures, are bought chiefly by the Jagannath pilgrims, and are not only regarded as souvenirs, but are used as idols for worship. The material of which they are made is a kind of black magnesian rock, intermediate in composition between potstone and serpentine, approaching the former in appearance, but of a less greasy grain. It is quarried at the

villages of Santragadia and Gujadiha, a few miles south of Nilgiri in the hills bordering on Balasore, and at other places in the neighbourhood. Dishes, plates, and bowls are also made from this stone. The images after being carved are oiled and burnt black.

About forty men are employed in making these images at Puri.

A Collection of Utensils and Ornaments used in Hindoo Religious Worship. From Howrah.

Kosá. A receptacle for holy water.
Kusi. An utensil used for ladling water from the kosa for bathing the idols.
Tát. A tray on which the Hindu idols are placed for bathing.
Puspapátra. A platter for keeping flowers before the idols.
Kunda. A deep tray used as a receptacle of water offered to the idol.
Padmásan. A bronze lotus stand for the idol.

The utensils used in the worship of idols are generally made of copper but the Sástras permit the use of those made of fig-wood. Those who can afford have them made of silver. Three vessels are necessary for the performance of a "Puga," viz., the "Prokshanipátra," a vessel from which water is sprinkled on the offerings, the "Arghyapátra," the vessel in which arghya is established, and the "Sruva" or vessel for pouring water or other liquids. The kosá with its two appendages, the kusi and the kunda, serves the purpose of all the above-mentioned vessels.

Dr. Leitner, Lahore.

Fourteen idols in brass and three in clay. (The former from Allahabad, the latter from villages in Rawulpindi district.)
Buddha in brass, from Burmah.
Male and female emblems.
Utensils, ornaments, paintings, &c. used in Buddhist and Hindu worship. Some of these have been described elsewhere, and will have to be studied in connexion with the next group and with the ethnographical catalogue.

Rangoon Local Committee.

Hpoongi's bowl and stand from Bahmo. This is one of the begging bowls used by the Buddhist priests to collect the offerings of food, &c. made to them by the Burmese.
Specimen of glazed metal applied to the ornamentation of Buddhist pagodas and other religious edifices.

GROUP XXIV.—OBJECTS OF FINE ARTS OF THE PAST. EXHIBITED BY AMATEURS AND OWNERS OF COLLECTIONS.

Dr. Leitner, Lahore.

Bronze image of Budda.
Collection of 1,000 coins, Bactrian, Parthian, Arsacian, Kishmîri, Indo-Muhammadan, Kufic, and others in gold, silver, and copper.
Collection of 184 Græco-Buddhistic, Indo-Scythic, and ancient Hindu statues and sculptured fragments from Yusufzai, frontier of Affghanistan, Swát, &c., representing religious, social, and historical scenes, architectural forms, &c.

I. Græco-Buddhistic, which show the influence of, presumably, Greek art on the representation of early and pure Buddhism.
II. Indo-Bactrian, which show the relation of the Bactrian Satraps with Buddhist or other North Indian princes.

These two groups were chiefly found at Takht-i-Bahai, in Yusufzai, in 1870, in various parts of the Punjab Northern districts (Taxila, Rawulpindi, &c.), and in Swát.

III. Indo-Scythian.
IV. Ancient Hindu.

These were chiefly found in the central provinces of India many years ago.

V. Indo-Buddhistic, as showing the gradual corruption of Buddhism by re-absorption into Brahminical forms. Chiefly collected about the Jhelum district of the Punjab.
VI. Barbaric. Found in the Central Provinces.

1 to 12. Photographs of sculptures and fragments referable to the above groups.

The following are also enumerated as a portion of Dr. Leitner's collection.

1. Hindu deity, apparently modelled after Budda obtained from a nun at Keta's (the ancient Sinha-para, now a sacred tank and shrine in the Jhelam district of the Punjab), in whose family it is said to have been for 800 years.
2. Lingam and urn (male and female emblems).
3. Casts showing (a) fire worship; (b), the public games at the times of the Græco-Buddhists; (c), Bactrian camels, as proof of northern invasion; (d), Indo-Scythian king; (e), face of Indo-Bactrian king.
8. Very ancient brass jug, elaborately carved, showing various scences out of the Ramayana, &c. In the first row the hunt and rape of Sita; in the second a Sanscrit invocation; in the third various scenes in the conquest of Ceylon; in the fourth various incarnations of Vishnu culminating in that of Buddha; in the fifth Shivaic emblems. This jug is almost a resumé of Indian mythology.
9. Indo-Scythian king, still showing traces of the head-dress of the Græco-Bactrians and corruptions of Greek art, under seven-headed serpent.
10. Head of barbarian.
11. Mythological groups. Krishna sporting with Radda; goddess suckling a swan (the Indian version of the history of Leda), &c., &c.
12. Barbarian king wearing a corrupt Græco-Buddhist head-dress.

13. A Sati Group; the widow who has burned herself with her husband holds his hand and wanders with him to the next world. This sculpture is very ancient, but its coarse imitations in clay or marble are often found on Sati monuments in India.
14. Brass Buddha already referred to, reposing under a dragon.
15 and 16. Photographs of Buddhist temple and idol.
17. Ancient Rajput, with raised thin arm and Hindu ornaments on body.
18. Portion of body of Rajput (?) in red sandstone.

GROUP XXV.

SECTION I.—ARCHITECTURE.

Madras Committee.

Model of an Indian village. Done by natives of Condapilly.

R. F. Chisholm, Madras.

Drawing of the new central railway station, Madras.

SECTION II.—SCULPTURE.

Madras Committee.

Collection of figures illustrating various customs, castes, and trades of India. Modelled by the natives of Condapilly.

Native tradesmen at their crafts.
Palaquin with bearers.
"Dancing girls."
"Band of acrobats."
"Native prince and escort," &c.
"Band of musicians."
"Tonjan and bearers.
"Acrobats with sacred cow."
"Specimens of the different castes of natives of Southern India."

Bengal Committee.

Figures (2). Carved in stone. From Sarun.
Cow and calf.
Lion couchant.

Jadunath Pal.
Ramchandra Pal.
Ramlal Pal.
} A series of clay figures modelled and painted by the exhibitors. From Kishnaghur, Nuddea district.

The collection includes the following:—

Elephant and mahout.
Ditto ditto in motion.
A buffalo.
A Brahimini or sacred bull.
Ditto ditto enraged.
Ditto ditto about to charge.
A bhisti (water carrier).
A ghasiara (grass-cutter).
A jalia (fisherman).
A Caubuli fruit seller.

Kishnagur has long been known for miniature modelling of this kind. The various Indian castes and occupations; bazaars filled with figures; animals (chiefly bulls, buffaloes, and elephants); and the ordinary vehicles of the locality are favourite subjects for representation. There is considerable delicacy in the modelling, the figures are instinct with character, and their *pose* and action is generally excellent. It is to be regretted that the modellers have an unhappy predilection for introducing pieces of real fabrics in the clothing; and actual hair and wool in the figures themselves; and in the accessories, straw, grass, &c. This occasionally lowers their work to the level of ingenious toy making.

India Museum, London.

Figures modelled in clay. From Bengal. From the London Exhibition of 1871.
Models of Indian fruits. From Bengal. From the London Exhibition of 1871.

SECTION III.—PAINTING.

Madras Committee.

A collection of paintings (96) on talc, illustrating native castes, occupations, scenes and subjects in Hindoo mythology, &c. From Trichinopoly.

The "avatars" or incarnations of Vishnu.
Hindoo deities.
Native castes.
Native processions.
Native traders and workmen.
Indian birds.
Indian butterflies.

H.H. the First Prince of Travancore.

Oil painting representing a native lady playing on the Indian lute, with her companion listening. By Ramasawmy Naidoo, of Travancore.
Miniature portrait of H.H. the late Maharajah of Travancore, on ivory plate. By Ramasaway Naidoo, of Travancore.

Dr. Hunter, Superintendent of School of Arts, Madras.

Oil painting representing a "Scene at Warkully on the Western Coast," India.

Singaperoomaul Raj, Madras.

Miniature painting on ivory representing "Col. Lawrence with Mahomed Ally, Nawab of the Carnatic."

Collection of paintings on ivory. Adapted for setting as bracelets.

Series of paintings on ivory. Adapted for setting as buttons or studs.

Water-colour sketches (6) of natives.

Bombay Committee.

A series of paintings (5) illustrating various manufacturing processes, as distilling, weaving, cotton cleaning, &c. From Kutch.

Bengal Committee.

Paintings on mica (2), representing the "Taziya" or "Mohurrum." From Patna.

Generally but erroneously described as paintings on talc. The "Taziya" is the representation of the tomb of Hasan and Hussain which is carried in procession at the Muharram festival.

Two rude tempera paintings on cloth, representing an old temple in Bishenpur, called "Jorbangla." From the Bancoorah district.

Illuminated Manuscripts (2) of the Mahábhárata, the great epic of Krishnadvaipáyana Vyása.

These two manuscripts contain the complete Mahábhárata except the last book, which is styled the Svargarohana parva, or the book treating of the ascent to Paradise of the Pandavas. The MS. No. 21 has the following books:—(1), the Sailya parva; (2), the Gada parva; (3), the Mansala parva; (4), the Sauptika parva; (5), the Stri parva; (6), the Asvamedhika parva; (7), the Asramavasika parva; and (8), the Ishika parva. The MS. No. 22 contains: (1), the Adi parva; (2), the Sabha parva; (3), the Aranya parva; (4), the Udyoga parva; (5), the Bishma parva; (6), the Drona parva; and (7), the Kurna parva. The manuscripts are beautifully illuminated in the peculiar Hindu style, and as the figures represented are from the Hindu pantheon, they add to the sanctity of the productions. The paintings to No. 22 represent the ten avatars of Vishnu; viz. (1), the Matsya or the fish; (2), the Kachchhua or the tortoise; (3), the Varaha or the boar; (4), the Narsinha or the man-lion; (5), the Vamana or the dwarf; (6), the Parasurama; (7), the Rama; (8), the Valarama; (9), the Bauddah; (10), the Kalki. The writing has been executed in the minutest form possible, but the letters are so carefully formed that they are all distinct and legible. Such manuscripts are never used in reading, but are placed upon an altar, and are worshipped as sacred things. The Devimahatmya of the Márkandeya Purána, the Srimatbhágavata and the Bhagavatgítá are very often squeezed into small paper packets and rolled up into little gold tubes to be worn as charms, &c. The accuracy of these two manuscripts is particularly noticeable.

Hossain Ali Khan, of Delhi and Calcutta.

Paintings on ivory (by the exhibitor). 12 mounts, bearing in all 49 paintings, as follows:—

The great Jumma Mosque at Delhi.
The Tajmehal at Agra, garden side.
Mahommed's Tomb at Medina.
The Temple at Umritsar.
The Fortifications at Delhi.

One plate 6×4 in. panelled into nine compartments, containing views of buildings, streets, &c., at Lucknow.

River side view of the Taj, Agra.

One mount bearing three separate plates representing the following:—

a. Jumma Musjid, Delhi.
b. Nadir Shah's Tomb, Delhi.
c. King's Palace, Delhi.

One mount bearing three separate plates representing the following:—

a. Taj Mehal, Agra.
b. The Kootub.
c. Jumma Musjid.

One plate panelled into nine compartments containing the following views:—

a. The Kutub.
b. Tomb of Sullim Shah.
c. The Jumma Musjid, Delhi.
d. King's Palace at Delhi.
e. Cawnpore Well.
f. Temple of Ahmed Solur.
g. Fortifications of Agra.
h. View in Agra.
i. View of Jerusalem.

One mount bearing four separate plates representing the following:—

a. The Right Akbar of Delhi.
b. The Temple of Amritsar.
c. View of Jerusalem.
d. View on the Bombay Railway.

One mount bearing fifteen separate plates representing the following:—

a. The Taj at Agra.
b. Temple at Amritsar.
c. Moti Musjid.
d. Sajdar Jung's Tomb.
e. King's Palace, Delhi.
f. Jumma Musjid, Delhi.
g. Moti Musjid.
h. Temple at Amritsar.
i. The Kutub.
k. Taj at Agra.
l. King's Palace, Delhi.
m. n. o. p. Four minute medallions for studs.

Baboo Sridhur Sahi, Zemindar of Maujha, Sarun district.

Native paintings (4), in tempera, on paper, as follows:—

Musician playing before a Mahomedan Nawab.
Hunting scenes (2).
Curious group of figures.

This is an example of a very favourite caprice of Hindu painters, namely, the forming of the figure of an animal such as an elephant, a horse, a camel, a peacock, or the like (or even a vehicle, as a palki with bearers) out of a number of other animals, or out of human figures, ingeniously grouped and twisted to fit into and define the main outline. Among the Vaishnavas the elements used in this building up are generally nine female figures representing the nine favourite Gopinis forming an elephant or a horse for Sri Krishna to ride upon. When the group forms an elephant the name "Navanarikunjara" (the nine-woman-elephant) is given to the picture. The horse is called "Navanarituranga" (the nine-woman-horse).

N.W. Provinces Local Committee.

Collection of drawings (54) on mica, illustrative of native customs, trades, conveyances, &c. From Benares.

Ismail Khan, Delhi.

Miniatures (24) on ivory of Kings and Queens of Delhi.
Miniatures (3) on ivory, of Akbar Khan, Taj Mahal, and Gulab Singh.
Ebony box. With nine miniatures on ivory, set in lid.
Sandal-wood box. With nine miniatures on ivory, set in lid.
Miniature on ivory of a female figure.

Laja Lam, Delhi.

Box. With painting on ivory (10 figures), set in lid.

Zoolpear Ali, Delhi.

Ebony box. With picture of Kuth.

India Museum, London.

Collection of paintings from Jeypore. From the London Exhibition of 1871.
Collections of drawings from Madras and Bengal From the London Exhibition of 1871.
Water-colour drawings from Madras. From the London Exhibition of 1872.
Collections of rough oil paintings on mythological subjects.

J. L. Kipling, Bombay.

Series of Sketches of the Craftsmen of North Western India. (From the London Exhibition of 1871.)

Nos. 1 to 12. Shawl Cloth (Pushmeena) Manufacture (4396–4435):—

1. Sikh comb cutter. Umritsur.
2. Cashmere woman carding (pushm) shawl wool. Umritsur.—Uncleaned pushm is sold ordinarily at about 1 rupee per seer. In this state it is full of long hairs, &c., which are carefully removed by hand, and it is carded and spun by women, who earn from 1 to 1¼ annas per diem.
3. Spinning shawl wool (pushm). Umritsur.
4. A shuttle maker. Umritsur.
5. A shawl loom. Umritsur.—The pattern is written out on a paper inserted in the gear of the loom and recited in a sort of chant by the leading workmen. In good times weavers earn about 3 annas per diem, but the war has almost ruined the trade.
6. A shawl loom. Umritsur.
7. Cloth finisher (Purusgar). Umritsur.
8. Cloth finisher (Purusgar). Umritsur.—Shawls, besides being washed and beaten on blocks of wood, are trampled upon vigorously. This thickens the threads and softens the fabric.
9. Shawl embroiderers. Umritsur.—Shawls embroidered by the needle are much cheaper than those woven on the loom.
10. Shawl embroiderers and piecers. Umritsur.—Shawls are woven in pieces, and afterwards sewn together.
11. Edging and belt weaver. Umritsur.
12. Silk winding for embroidering thread, edgings, &c. Umritsur.

Nos. 13 to 18. Silver-gilt Wire Drawing for Gold Lace and Gold Thread (Kullabatoon).

13. Silver-gilt wire drawing. Umritsur.
14. Silver-gilt wire drawing. Advanced state. Delhi
15. Silver-gilt wire drawing. Umritsur Jail.
16. Flattening silver-gilt wire. For gold lace, gold thread, fringe, &c. Umritsur.
17. Flattening silver-gilt wire. For gold lace, thread, fringe, &c. Delhi.
18. Kullabatoon making. Umritsur.

Nos. 19 to 25. Gold lace, braid, and fringe making.

19. Warping gold wire. Flattened for lace. Delhi.
20. Winding gold wire. For weft of gilt lace. Delhi.
21. Gold lace making. Delhi.
22. Gold and silver lace making. Delhi.
23. Stamping gold and silver lace. Delhi.
24. Gold fringe making. For caps, trimming, festival garments, &c. Delhi.
25. Gold thread and silk braid twisting. Delhi.

Nos 26 to 32. Embroiderers in Gold Thread (Zirdoy), Jewelled Cloths, Spangles, &c.

26. Embroiderer of caps, slippers, &c. Lucknow.
27. A pattern draughtsman. Simla.—For the larger forms a pricked paper pounce is used, and the details are filled in with a reed pen and lamp-black. In some kinds of work, engraven wood blocks are used.
28. Cap and slipper embroidery. Gold thread traced on dark grounds. Silk or velvet. Delhi.
29. Gold embroidery. On velvet ground. For throne cushions, canopies, horse-housings, &c. Delhi.
30. Embroidery in gold. Elephant housings. Delhi.
31. Jewelled and spangled cloth embroidery. Delhi.
32. Jeweller setting stones. In thin silver gilt, for jewelled cloth. Delhi.
33. A carpet loom. Umritsur Jail.—The pattern is read aloud by a man sitting behind.
34. A carpet loom. Cawnpore.
35. A spinning wheel in the hills.
36. A loom in the hills. Blanket weaving.
37. Muslin turban weaving. Gold ends, imported English yarn. Delhi.
38. Floor cloth. (Dhuree) weaving. Umritsur Jail.
39. Silk weaving. Umritsur.
40. Silk weaving. Agra.
41. Cleaning and opening wool for blankets with the Pinjara. Bombay.
42. Printing in water gold size. For tinsel or gold-leaf ornamentation over coloured cotton prints, for wedding garments. Delhi.
43. Spangled slipper maker. Delhi.
44. Elephant housing fringe making. Coloured silks and gold and silver thread. Delhi.
45. A potter starting the wheel. Simla.
46. A potter. Simla.
47. Painting earthenware toys. Delhi.
48. A Lucknow terra-cotta figure modeller.
49. A Lucknow terra-cotta figure modeller.
50. A silk dyer. Umritsur.
51. A dyer's shop. Cawnpore.
52. A worker in marble inlay. Agra.
53. A worker in marble inlay. Umritsur.
54. A pearl borer. Lucknow.
55. A Bidree worker. Lucknow.
56. A wood carver. Simla.

J. L. Kipling, Bombay.

Series of Sketches of Cotton Cultivation in Western India, and of the leading members of the Marathi Village system in the cotton districts. By J. L. Kipling, Esq. Sir Jamsetjee Jejeebhoy, School of Art and Industry, Bombay. (From the London Exhibition of 1872.)

753 (5,208). The "Nágur."—The "nágur" is a heavy plough used in breaking up stiff land, and where, as in fallows, "kundar" or couch grass has taken firm root. The projecting iron bar shown in the sketch takes the place of the coulter of an English plough, while the elegant curves of the English plough-share are represented by the rude hollowing of the under surfaces of the block which supports it. Yet the "nágur" is a very effective implement, it is cheaply made, and easily repaired. Six bullocks are required for the draught, and each pair is attended by a driver.

751 (5,209). The "Bukhur."—The "bukhur" is the plough in common use when the land is fit and easily workable. It is perhaps the most useful implement employed in the cotton field and in general cultivation. Practically it is a wide dutch hoe, with a blade of about 1 (one) foot 10 (ten) inches wide, set in two feruled pegs depending from a heavy block of wood, from which a pole ascends to the yoke, and fitted with a short handle sloping backwards. The parts are separately carried to a field, and there joined up, while the simple rope gearing is so contrived that the stress of the draught pulls all tightly together. An important feature in the simple machine is the bamboo carried by the driver, used to stimulate the animals, but mainly to steady the plough. Two indentations are cut in the upper face of the main block of the "bukhur," and in one of these the point of the bamboo is rested. It will thus be seen that the cultivator in this sketch is not gracefully posing himself, since his weight, though comparatively slight, as he leans on his bamboo, is of vital importance as a steadying power.

755 (5,210). The "Dúsah."—For sowing cotton, which requires a wider space between the rows than cereals, an arrangement called the "dúsah" comes into play. This consists of the block of the "bukhur" (*vide* sketch No. 2) and all its gear, with the exception of the iron blade and the iron feruled pegs which carry it. For these last two sharpened "babool" pegs are substituted, and two bamboo tubes fitted with "babool" feet are dragged behind at a distance of about four feet. Down these tubes the cotton seed is dropped as the contrivance straggles creaking along. The furrows traced by the wooden pegs of the "bukhur" are slightly deepened by those of the "surki ka surta," as the following bamboos are called. The bamboos are fitted at top, each with a seed cup like that in the "mogledah" or "teefun" (*vide* sketch No. 4), and the seed drops behind the point of the wooden foot on which they rest. After this follows the "bukhur" proper, lightly held, which covers up the seed.

756 (5,211). The "Mogledah."—This excellent seed drill is used in slightly modified forms in the greater part of Western India. In Guzerat, for instance, it has four or five "nallis" or pipes, and is called "phurko." In the Deccan, where it is occasionally prettily carved and ornamented, it is called "tipan;" in Khandeish "paribhar," and in the Southern Marathi country "kúrgi." It is everywhere, however, an ingenious and useful contrivance. It is not used for cotton, which requires wider spaces between the rows than cereals. From a heavy block of wood depend three strong limbs projecting forward, and each fitted with a down-pointing iron shoe ending in a spike. From holes in these arms ascend bamboo tubes (usually three), meeting in a seed cup or hopper of turned wood. The parts are carried separately a-field, and the forward pull of the bullocks draws all tight. The driver or ploughman, as with the "bukhur," "dowrah," &c., steadies the whole with a bamboo resting on the main block of the contrivance. Six, or sometimes only four bullocks are used for the draught. It will be seen that the three teeth of the drill draw three tolerably deep furrows into which the seed, supplied from the waistbelt of a man walking alongside, drops through the bamboos. I believe in the Khandeish form the seed store is carried on the body of the drill in a kind of bucket of twisted rope. It is seldom that the ploughman or driver either of this drill, the "nagur," or the "bukhur," leans very heavily on the loosely fitted handle of these implements. They are used to steady the draught, but never with any effort like the vigorous two-handled steering of an English agriculturist. It may be worthy of note that seed drills have been in use in this country from time immemorial.

757 (5,212). The "Dowrah."—The "dowrah" is a "bukhur" in miniature—a bullock hoe in actual fact—drawn between the rows of growing plants, stirring up the soil and uprooting the weeds. A pair of bullocks, usually muzzled to prevent their cropping the leaves, draws two of these implements, each attended by a driver, who guides the "dowrah" between the rows while they pull on a common yoke. As in the case of the "bukhur," a bamboo carried by the driver, and rested on the block, serves the double purpose of quickening the bullocks and steadying the implement.

758 (5,213). Weeding by hand.—Besides the turning up of the cotton soil with the "dowrah" or bullock hoe, weeding by hand is also extensively practised. This is done entirely by women, who are paid in kind at the rate of four pounds of grain (worth about two annas) per diem. A rude iron knife called "khoorpah" is the only tool used. The same women also perform the picking when the cotton is ripe. At the close of the day each picker carries her day's gatherings to a corner of the field, where the "ryot" divides it into ten and sometimes into twelve equal portions, of which she selects one as her wage. Over this operation much talk and deliberation are expended, and the system is alleged to have an injurious effect on the cotton, for naturally the picker, being paid only for quantity, is careless how much leaf, dirt, and unripe cotton she collects so long as her heap is large.

759 (5,214). The Berar "Churka."—The Berar hand gin is identical in principle with that of Kattywar, Guzerat, and Khandeish, but it has not the driving wheel peculiar to those districts, which gives a higher speed to the upper iron roller, and in consequence is more effective. The Berar "réchi," as it is locally called, consists of two rollers, one of iron of the thickness of a kitchen poker, and one of wood, generally "tiwas" or "behr," or sometimes "babool" about as thick a

a kitchin rolling-pin. These revolve in different directions, the iron roller being turned as fast as possible by a woman who has no other occupation, while the wooden one is more slowly turned by a woman who uses her other hand to feed the gin, The machiue is kept steady by one or two large stones laid on a tail bar projecting from the back of the frame. A gin is said to cost about Rs. 1. 12 as., of which the blacksmith claims a rupee for the iron rod or roller, and the carpenter the remaining twelve annas. Two women in a good day can clean about 15 lbs. of cotton, and they are usually paid in cash according to the weight of seed separated, and occasionally in kind. Large companies work in sheds, accompanied by numbers of children of all ages, whose presence is often made an excuse for the slovenly way in which the work is done.

760 (5,215). The Hingunghat "Churka."—One of the simplest machines for cleaning cotton is the Hingunghat "churka," which has two wooden rollers turned in different directions from one handle by means of an ingenious use of a double screw. This is worked by one woman, who sits behind the frame, on the stones, which keep it steady. It is much inferior to the usual Berar "rechi," and, excepting cheapness, possesses no particular merit. The rollers are tightened up by means of wedges and bits of stick thrust under a wooden chuck in the slot of the frame in which they are set, and they are slightly thicker at one end. This is not used in West Berar, but extensively about Hingunghat.

761 (5,216). Filling the "Docra."—A "docra" holds about 140 lbs. of cotton, and it is filled much in the same way as woolbags are filled on English sheep-farms. The gunny bag is slung in some convenient place—often, as in the sketch, in a corner of the ginning shed—and the cotton is trampled down by a man standing inside. The bag is usually wetted first, and the reason given for this bad practice is that the cotton packs better. The real reasons are that an inferior quality of gunny can be used while wet, and that the moisture adds to the weight. It is certain that the water injures the staple to some extent, especially when the filled bags are piled in close heaps. Eueopean merchants, agents, and officials of the cotton frauds department have tried in vain to put down this practice, which is cherished by the conservative native.

762 (5,217, 5,218). *Going to Market and a halt by the way.*—The word "bojha" (a bullock load) has come to be accepted as a commercial unit. Cotton is sold at so much per "bojha"—about 280 lbs., contained in two "docras" or bags. Few animals possess the powers of endurance of the Indian bullock, who steadily plods along under his burden, day after day, with roadside grazing and a few sheaves of "kurbi" (dry "jowari" stalks) by way of provender. Cotton is brought in this way from great distances to the Berar markets, sometimes, indeed, from upwards of two hundred miles. The pack bullocks, like those used by the "Wunjáris" for this and other merchandise travel in companies, a few carrying bells, as pack-horses used to do in England. The saddles are ornamented on their conical peak, which resembles that of the horse, "ekkas," in the N.W. Provinces with an embroidered herring-bone pattern, neatly worked in thick coloured cotton, or with a patch of gay cotton print, and also with a tuft of horse hair, or a feather or two. When halting, the "docras" are piled together, and the men sleep on the lee side. It is hardly needful to point out how much the cotton suffers on these long marches where the hot, dust-laden winds penetrate the pervious gunny bags, and coat the cotton with fine sand. It suffers, too, from being rolled on the ground, wet or dry, but it also gathers a little weight. The figures in these sketches are not of the Wunjára caste, none of whom happened to be about at the time of my visit. Their heads are muffled up in cloths as a protection against the sun, dust, and hot winds. This has an odd appearance, but it is an invariable and most necessary practice.

763 (5,219). Going to Market (Bullock cart).—The bullock cart of India is made after many diverse fashions, and its capacity varies continually. The cart shown in the sketch is one of the older kind. contrived with no axletree; so that while the wheels are buried to their centres in deep ruts, it matters little what obstructions may lie between them. It is bound all over with strips of hide neatly interlaced, and it is braced and pulled together by many involved turns of leathern and hempen cords. There is a good deal of ornamental brasswork about some specimens, for it is useful in festivities and for diversion, as well as in the field or market. The driver has a cleverly contrived seat on the shaft or pole, which is formed of several poles skilfully bound together with hide and turned in a graceful curve, which secures strength and elasticity. Other carts are of squarer, simpler form (some are shown in sketch No. 5,221). The strongest cart, which in the Berars is said to be of Madras pattern (but this is by no means certain), can carry ten docras; but the ordinary Marathi cart is heavily loaded with eight. Many are only equal to four or five, and there are usually several carts in the Khangaun and other markets which have brought only one "docra."

764 (5,220). Going to Market (Camel). In the Berars camels are much used for the conveyance of cotton. Each camel carries twice the load of a bullock—*i.e.*, four docras or 560 lbs. The swifter breed is also employed to carry cotton telegrams "rui-ka-tar," into the interior from the markets and depôts, when they cover immense distances at great speed. The pack camels travel slowly in strings, and when loaded they strongly resent hills. "Which is best for you, O camel! to go up-hill or down?" Quoth the camel, "May God's curse rest on both, wherever met!"

765 (5,221). Waiting for an Offer. (Khangaum Cotton Market). It is by no means easy to make the cultivator who brings his cotton to market, or the "dalal" to whom he deputes the task of bargaining for him, understand how it can be that the same quality of cotton which was sold for, say rupees 90 per bojha the day before yesterday, is only worth some 88 or 86 rupees to-day. The rapid operations of the telegraph, when they lower prices, perplex and disgust him, and the Khangaum merchants have learned by experience that so long as the "ryot" remains perched on the top of his "àkha" there is little chance of coming to terms with him. There he sits in the morning sun, while the European merchants lounge about with an air of indifference, and "shroffs, dullals," factotums, agents of all sorts are busily arguing and persuading, quoting telegrams and the last Liverpool

rates. As one cartload is frequently the whole of his crop, and the amount it realises will be the most important part of his income for the whole year, it is not surprising that the cultivator should show much anxiety to get the highest possible price, and somewhat obstinately delay to accept a lower one than he had reckoned upon. At last some one gives way, a bargain is struck, and the event of a morning in the cotton market has taken place. The price has come out. The ice once broken, things are easy, and the market assumes a lively aspect. Sharp knives are plunged into "docras," followed by investigating hands, which carefully hold the samples in the shade, the better to judge of their quality and colour. Sales are now effected on all sides, and the cotton has fairly started on its eventful career.

766 (5,222). The "Pinjara."—"Pinjar" is the onomatopæical name of the instrument which in the country cotton trade takes the place of the "opener" or more recent "exhaust opener" of Manchester. It somewhat resembles a harp with a single string, and is similar in principle to the bow formerly used by felt hat makers. The vibration of the gut string is produced by blows with a heavy wooden plectrum, so to speak; and when directed on the cotton it disentangles the masses, drives off a certain quantity of dust, but in no way arranges the fibre; on the contrary, it is accused of breaking and injuring the staple while producing an appearance of great softness and openness. It would be quite useless as a preparation for machine spinning, but it seems to act well enough for hand work. The Pinjarars are exclusively Mahommedan who work at home, and also, like some of the peripatetic craftsmen of Europe, go about in search of work twanging the string of the "pinjar" as they go by way of advertisement. They are employed in the large towns to clean cotton flock mattresses, and they also clean and open wool as occasion offers. In Dharwar the "pinjar" is called "*bésé*."

767 (5,223). Preparing hoops for cotton bales.—This is a sketch in the yard of the French press at Khangaum, and shows a labourer employed in preparing hoops for full-pressed bales. A great quantity of hoop iron is consumed in this work, and during the pressing season numbers of men and boys earn a comfortable living at the work.

768 (5,224). Interior of a cotton press.—The dust and noise of this scene cannot be hinted at in a sketch. It seems to be a tradition of the cotton press that the greatest possible amount of yelling and bawling is essential to the due performance of the work, even where the noiseless engine does the hardest part. At the cotton screws where the capstan bars, so to speak, are hurried round by rows of men, a cadenced din is of use in marking the time, but there seems to be little need for it in a press-room. The cotton is emptied out of the "docras" and beaten with long canes, a process which gets rid of a certain quantity of the sand and dust which has filtered through the gunny covering, and disperses the rest. Then it is heaped into the square box on the right and weighed. By this time the shafts of the press have ascended, the door is opened, and by the help of a canvas shoot the cotton is tumbled into the press box, in which a row of men stand to trample it down. They usually clench a piece of cotton between their teeth to keep the dust out of their mouths. When the box is filled they come out, the gunny cover of the bale is adjusted, the door is closed, and the mighty arms of the press slowly descend. On the ground floor of the building the hoops and fastenings are adjusted, and the cotton which recently filled the spacious weigh-box is found compressed into a neat and handy bale.

769 (5,225). Cotton sampling at Sulkeah, Calcutta.—The Calcutta cotton trade is carried on on a different plan from that of Western India. Nearly all the cotton is sent down by rail full pressed from up-country screws. Arriving at Sulkeah, a suburb of Howrah, it is stored in huge brick go-downs, and there the buyers go to examine it. Five per cent. of the bales are allowed to be cut into, but even with this opportunity of examination the buyer frequently has a quantity of rubbish foisted upon him, and an immense variety of foreign matter of the most objectionable kind is found in the bales. One or two firms in Calcutta have commenced the Bombay plan of up-country agencies and presses, which does away with this unpleasant business. An elaborate system of "dustoor," or, in plain English, bribery and corruption, completely envelopes the trade when in the hands of agents and middlemen. When merchants or their agents buy direct from the producer and press at their own screws, there is a great saving, while the numerous dishonest practices of the native merchants are put a stop to.

770 (5,226). Putting cotton aboard cargo boats at Sulkeah.—The cotton go-downs or warehouses are near the railway at Sulkeah, and on the side of the river where vessels are not moored. The sketch shows the cargo boat in use, but it will be seen that the whole process of shipping is somewhat primitive, and by no means economical of labour.

771 (5,227). Country cloth stall in Khangaum Weekly Bazaar.—On market days in the Berars, travelling cloth merchants open stalls in the bazaars or on the market ground. This is a rude sketch of one of these stalls. The goods sold are usually "sari" and chowli bodice pieces, and are generally of country manufacture. Nagpore furnishes turbans and silk-edged "dhoturs" and "saris." Printed cottons, too, come from there, and from Sholapore, and also from Balapore, in the neighbourhood of Khangaum. But unhappily this once flourishing craft is dying out. There are still good patterns remaining, and good colours; but there is less demand for this class of goods, and Manchester supplies a certain quantity, chiefly turkey red prints, with yellow and other colours. The cultivators come to market on foot, in carts, on ponies, or on pack bullocks. A bargain is a long business; and as the "kúnbi" insists on measuring his purchases with the cubit measure of his own right arm, there is usually a good deal of discussion. The choice of a "sari" is a matter of much anxiety to the "kúnbi's" wife; and although the native draper may not have the polish of the English mercer, he certainly possesses all his fluency of speech.

772 (5,228). The "Deshmúkh."—The "deshmúkh" was the head of the village and Pergunnah system under the late government. His duties were to assist the "Talookdar," or "Naik," in land revenue assessments, in collecting revenue, in reclaiming waste lands, and other details of the administration of the Pergunnah. He received a

fee called "roosoom," a per-centage on the government demand on every village. Under the British Government his occupation *quâ* "deshmúkh" is gone, and most are now pensioners. The subject of the present sketch, however, is the hereditary "deshmúkh" of Khangaum, and, while retaining that honorary title, he acts as "patel," and has other duties, which he discharges with considerable ability. The pensioned "deshmúkhs" have been found very useful, as they are the depositories of much valuable local information, historical and traditional.

773 (5,229.) The "Patel."—The "patel" under the old government came third in the list of village officials, taking his place after the "deshmúkh" and the "deshpandia." Now that these offices are abolished, he is the final link in the chain connecting the government with the people following the "tehsildar," to whom it is his business to report all occurrences in the village of which he is head man. It is his business to collect government demands of all kinds, to assist the police in detecting crime and apprehending offenders, to carry out orders issued by competent authorities, to make transit arrangements for travellers of all sorts, but particularly for officials; to supply necessaries in the way of food, such as sheep, milk, fowls, eggs, &c. to all who encamp in his village. He is usually a man of some substance, and he is paid at the rate of five per cent. on the revenue collections of each year; so that his official income, called "ling," varies with the amount of revenue collected. The gateway behind the figure in the sketch shows rudely the usual entrance to a Marathi village.

774 (5,230). The "Kúlkurni."—The "kúlkurni" or "patwari" is the village accountant, scribe, and letter writer. He is usually in attendance on the "patel," whose accounts he keeps. It is his duty to keep correct and complete records of assessments, collections, balances, &c. of each village on forms supplied to him by the "tehsildar." He assists in the cutcherry, and he writes letters and petitions for the villages. He receives a "ling," like the "patel," of five per cent. on the government revenue derived from the village.

775 (5,321). The "Mahajun."—The "mahajun," banker, or "soucar" is often a wealthy man; nearly always in comfortable circumstances. He trades in cotton and lends money at high rates of interest, and his class has been freely accused of usury and oppression. Before the Indian cotton trade received the impetus given to it by the American war, and before markets were established where the "ryot" could dispose of his produce at first hand, it often happened that he was hopelessly in debt to the "mahajun," whose system of accounts was contrived on a principle of compound interest, so elaborate that each season only seemed to enmesh the cultivator more firmly in the toils. The subject of the sketch is a "Marwari," a race which has a special talent for money lending and commerce. On the other hand, it is alleged that his presence is indispensible, and that he is rather a blessing than a curse. The truth lies between the two extremes, and there can be no doubt that in a healthy state of trade, where competition and publicity are secured, the rapacity of the "mahajun," if he is rapacious, will of necessity be checked, and he will find his own place as a useful if always somewhat eager trader. The "Marwari" has few interests beyond money getting, and he is perhaps more obstinately wedded to degraded forms of Hindoo worship than any other race.

776 (5,232). The "Josi."—The "josi" is the village priest, and comes of a line of priests. He is of Bamun caste, and subsists mainly on the voluntary offerings in money and grain of the villagers. His chief duty is to read the "pancham" or almanac; it is also his business on auspicious days for commencing undertakings, journeys, and the like; to recite mantras and perform the ceremonies of marriage; to decide questions of observance and to receive back into caste fellowship those who accidentally or otherwise have violated its ordinances. The "josi" is usually a respectable stay-at-home member of the community, and is not to be confounded with those holy men who wander about clad only in a film of grey dust and ashes.

777 (5,233). The "Gárpagári."—The "gárpagári" is a mild kind of wizard, and in some sort a priest, although not attached to any temple or shrine. His chief function is to avert hailstorms from the crops—"gárá" is the Marathi word for hail—and to herald the approach of rain. He also gives charms against sickness in man or beast, and performs incantations. He is not exactly a rain maker, like the medicine men of African villages; but although he disclaims in time of drought the power of bringing rain, he is not loath to take the credit of it when it comes. The most striking part of his magic art is the noise he makes on a black buck horn, or at times on a conch shell. He is a recognised and highly respectable institution in Berar, and he receives tithe like any vicar; that is to say, one "páeli" (about four seers) of grain from each cultivation, besides fees for charms, amulets, and special cases. In the neighbouring province of Khandeish an ordinary "kúnbi" takes the name and performs the duties of the official "gárpagári" of Berar, and when hail is actually falling near a "pán" plantation he blows his conch to prevent it doing any harm. The "pán" leaves, however, frequently suffer severely from hailstorms.

778 (5,234). The "Dhobi."—The "dhobi" is the washerman, and washes the clothes of all who can afford it, always excepting those of the Dhers and other out castes who have their own washermen and barbers. He is paid in grain at harvest, and in cash sometimes. He makes sad havoc of the garments entrusted to him, but in large towns he attains to great skill in the getting up and finishing of "fine things."

779 (5,235). The Barber or "Hajám."—The duties of the "hajám" or barber are to shave all villagers and perform duly such hair-cutting, nail trimming and corn extracting as may be necessary, and to keep a light burning every night in the house of the head man of the village "patel" and in the village cutcherry; to carry torches at festivals, and attend on government officials when they visit the place. He is usually a great gossip, and knows everybody's business. On the death of a villager he attends to shave the head of the widow, and to take off her ornaments just before the body is carried to the place of cremation. He is paid in grain at harvest by the cultivators and by others in cash as he performs his business. He carries the utensils of his trade in a square leathern valise; these are simple, and consist of a number of country made razors, roughly made and fastened into handles like penholders, country

made scissors, tweezers, &c., and a small mirror, which is usually held in the hand of the person operated upon.

780 (5,236). The Carpenter. "Sútàr."—The village carpenter is a very useful member of the small republic, but there are evidences that he has not advanced in skill during the last two generations. There are many beautifully carved old houses in Marathi towns and villages, the work on which it would be difficult to equal now, and the technical points of squareness, truly fitted joints, and construction, generally are not so carefully attended to as of old. Still, the carpenter has some valuable traditions by which he faithfully abides, and although the greater part of his work is of a rough and ready sort, he is capable of better things than would be imagined from a survey of his scanty apparatus of tools. These consist of saws, hammers, sometimes planes, the universal and most useful adzé, and two or three chisels. Holes are invariably bored by a variety of what English workmen call the fiddle-drill or bow-drill. The toes are used to grip the work tightly while both the ordinary plane and hand saw are made two-handed instruments. He makes and mends agricultural implements of all kinds, and is usually paid in grain at harvest time.

781 (5,237). The Blacksmith. "Lohar." — The blacksmith makes usually a good living in the cotton districts, where gins, ploughs, and cart-wheels constitute the greater part of his work. It is seldom that he is really skilful at welding. Sometimes the weld comes right, and sometimes it does not, the usual fault being that the iron is burnt. Blacksmiths' bellows are of various kinds; those shown in the sketch are of the best pattern. They are frequently shapeless leathern bags, not fitted with ribs at all. A circular fire of pure cow-dung (cow-dung cakes of fuel are, for other purposes, mixed with straw, leaves, or chaff) prepares the tire for the wheel on which it is fitted precisely as by wheelwrights in Europe. The blacksmith is paid in money and also in grain. He does not shoe horses or bullocks, this being the duty of the "nálband." Some of the best adzes, "kúrád," are made by travelling blacksmiths of gipsy-like appearance and habits. Near large towns, and in connexion with the numerous railway and other works, native smiths attain to great skill, and in light work they are, with careful supervision, capable of rivalling the English workman. It is notable that the English anvil is used whenever available by the "lohar."

782 (5,238). The "Bunia."—The "bunia" sells grain, cotton seed, ghee oil, and all sorts of produce, and in the exercise of his business he perhaps comes in for even more abuse than the "sankar" or "mahajun." In seasons of scarcity the "bunia" usually gets the credit of keeping up the price of food grains, and he no doubt does his best to make hay while the sun shines. But in these times of more free inter-communication between districts it does not so much avail him as of old to collect all the grain in his neighbourhood and to put a fancy price on it; for supplies now come in from all sides. He is a keen, if not always a very intelligent trader. He prefers the seat in his little shop in the narrow street, but goes out on business on his pony, which is somewhat gaily caparisoned with red and yellow headstall, crupper, martingale, and girths, in none of which is there a morsel of leather.

783 (5,239). The Potter. "Kumár."—The "kumár" or potter is not on the establishment of the village community in the same official manner as some other craftsmen, but none the less he is a useful and important person. He is usually of wandering habits, but there are few villages in which the reek of his fires is not seen and smelt. He usually keeps many small donkeys, by the help of which he and the numerous members of his family collect fuel and clay. His implements are the potter's wheel, and a small pick to dig clay. After his "ghurrahs" are shaped on the wheel he finishes them by hand, and the way in which he handles and pats the thin flexible vessel in the green state, and yet preserves its circular form, is a feat which most European potters who finish from the wheel on the lathe would consider almost impossible. He also makes roofing tiles; these are "thrown" on the wheel in the shape of tapering cylinders, which are sliced in halves while wet.

784 (5,240). The "Mahar."—The "mahar" is one of the most useful of the village servants. He is recognisable by the long bamboo he invariably carries. He acts as an assistant to the "patel," and serves as guide to passengers, he is also post-runner and messenger to the village. He has a right to the skins of all dead animals, which it is his business to remove to a given spot near the village. He is of low caste, but he boasts that there are people lower still. The "mahars" and one of their caste subdivisions of a village near Nassick have had a law-suit carried from court to court for some time concerning their right to certain fractions of the bodies and skins of dead cattle. Although the touch of the "mahar" is pollution to higher castes he is personally cheerful and contented enough, and he makes a tolerable living from his numerous duties, for which he receives both money and grain as payment.

785 (5,241). The "Mhang."—The "mhang" takes, without repining, the lowest place in the social scale. He is a musician, and plays on his most simple instruments at weddings and other ceremonies. He receives an allowance of grain at harvest time, but, generally speaking, he lives as he can. He may not be a very useful or distinguished member of the commune, but at least he is a modest and unassuming one.—*J. L. Kipling, Esq.*, Sir Jamsetjee Jeejebhoy School of Art and Industry, Bombay.

J. Griffiths, Bombay.

Collection of Sketches in Water Colours by the Exhibitor, Sir Jamsetjee Jejeebhoy School of Arts, Bombay. (From the London Exhibition of 1872.)

1,268 (—). Mahar girl, carrying a vessel on her head.

1,269 (—). Mahar girl, with a basket under her arm.

1,270 (—). Mahar girl, with a basket on her head. —Showing mode of wearing "saree" by this community of the Deccan and Konkan.

1,271 (—). Fisherwoman, carrying fish on her head.

1,272 (—). Soortan.—Showing mode of wearing "saree" and "cholee" by Guzerathi women of the lower class.

1,273 (—). Marathi woman, with vessel on her head, and anklets.

1,274 (—). Marathi woman. Mill woman.—Showing mode of wearing "saree" and "cholee" by Marathas of the Deccan and Konkan.

1,275 (—). Carnati woman, with Ghumil or tugaree on her head.—Illustrating the mode of wearing "saree" and "cholee" by women of the bricklayer class. They belonged first to Canara, but have now become part of the population of the Western Presidency.

1,276 (—). Purdasi milk woman, carrying four milk pots on her head, and a butter tray in her left hand.—Showing mode of wearing the "ghagra," "cholee," and "loongee." These people, first imported from Upper Hindustan, now form part of the population of the Western Presidency.

1,277 (—). Mussulman woman of the Konkan, wearing the "chadur." A "saree" is worn inside.

1,278 (—). Sinde Mussulman. Potter in the Sir Jamsetjee Jeejeebhoy School of Art, wearing the "phetta."

1,279 (—). Kutchee stonecutter, employed in the Sir Jamsetjee Jeejeebhoy School of Art, wearing the "phetta."

1,280 (—). Purdsei, employed as a watchman, wearing the "phetta."

1,281 (—). Muhar, wearing the "pugree" or turban.

1,282 (—). Brahmin, wearing the "pugree" or turban.

1,283 (—). Bullock Rekla, with bullocks and driver. Showing the use of the curtain in the Rekla and the zool covering for the bullock.

J. J. Fonceca, Madras.

Eight Water Colour Sketches, by the Exhibitor. (From the London Exhibition of 1872.)

SECTION IV.—DRAWING.

Madras Committee.

The Sanscrit work "Ramayanum" written in Telugu characters on Kajan caves.

A work on medical science written in Telugu characters on Kajan caves. Madras.

Dr. Leitner, Lahore.

Collection of Persian, Turki, Arabic, Sanscrit, Tibetan, Kashmiri, and other manuscripts, some richly illuminated and not yet published, on poetry, magic, theology, &c. &c.

1. The *Sahih Bokhari* is a highly esteemed commentary. It is written most exquisitely in what is called the "Lahore handwriting," and contains several thousand pages, It is supposed to be very valuable and to be very rare. In attestation of the authenticity of this MSS., it bears on the flyleaf the signature of Emperor Akbar and his court.
2. The *Shah nama* of Ferdusi, a well written and illuminated MSS. of this well known poem.
3. *Delail-ul-Khairát.* A Muhammadan prayer-book, very well written. It contains a plan of Mecca.
4. *Mahbub-ul-Qalib,* by Barkhardar ibn Mahmûd, a Turcoman. The book treats of ethics, &c. &c., and is written in a good Persian style.
5. *Rozat-ush-Shúhdái,* by Shafi Ibn Abdur-rahîm, who translated it into Turki (the Central Asian original of Turkish) from the Persian original of Mulla Hussain Káshif.
6. *Kitáb-us-sür* treats of the miracles performed by the prophet Muhammad. (Turki.)
7. *Bargus Armás* treats of the Ahl-i-Milet and Abu Muslim. (Turki.)
8. *Hassan Mukhash,* a treatise on love, by the Kashmiri Ahmad Baba, in that language. As far as is known no Kashmiri MSS. have yet been brought to Europe.
9. *The Patience of Saints,* first Kashmîri specimen translated into English by Dr. Leitner. It is called the "Dastan Shibli," or "Story of Shibli" one of the patient saints.
10. *Sikandar nama,* written by Pandit Ram Lachman in the Kashmiri language.
11. Joseph and Zuleika (wife of Pharaoh). Poem in Kashmîri.
12. Leila and Majnûn. Kashmîri version of these two infatuated lovers.
13, 14, 15. *Poems of Muhammad Gami* and other Kashmîri writers.
16. A very well executed MS. containing a *Collection of Turki (Central Asian) Love and War Songs.* Very rare, if not unique.
17. A splendid illuminated specimen of *toe writing* (the toe is driven along behind the paper, which it pushes up so as to form the letters, which look as if they were embossed). It was done at Lahore.
18. A geography written by a Bokhariat some centuries ago, with quaint maps.
19. Copy of the same, with a splendid cover, considered one of the finest specimens of handwriting.
20. Several thousand pages of Tibetan printing, forming (a), a work on cosmogony; (b), a version of the teaching, &c., of Buddha; (c), a prayer-book; (d), slips of various kinds, genealogical, religious, &c., referred to in Ethnographical Catalogue.
21. The miracles of the Prophet, in the Turkish language (Muajizat-un-Nabi).
22. The *Bhagvat* in Persian.
23. Five illuminated addresses (modern).
24. Details of a Sanscrit Treatise on Magic (with translation). The book is named "*Goraksh Sataka,*" or the hundred verses dedicated to Goraksh, a Hindu devotee and founder of a sect of "*Yogis,*" the mendicants recognised by a wooden or glass earring which they put across their ear. The name of the author is unknown, though he is evidently a follower of Goraksh. The book was copied in "Sumbut" 1623 or 1566 of the Christian era, by one named Krishn dass (?). It contains the system of "*Yoga,*" which comprehends six operations, as follows:—1. "Asun" or the postures of the devotee, the number of which is said to equal the number of the species of living beings on the earth., viz., eight million and four hundred thousand, of which, how-

ever, eighty-four are enumerated, the least of which is a mode of squatting called "*padmatan.*" 2. "Prānāyāmā," which consists of three operations., viz., drawing in, holding, and letting out the breath. It is said that by the practice of Prānāyāmā one can hold one's breath for days and months whether under water or under ground, and that one may by a peculiar exercise float in the air. 3. "Pratyahar," or restricting the senses. 4. "Dharna," or restricting the mind. 5. "Dhyan," or meditation. 6. "Samadhi," or deep meditation when one loses the sense of external objects. These operations are the same as those enumerated by Patanjali, the founder of the "*Yoga*" system, except the first two called "*Yam*" and "*Niyam,*" which consist in observing the rules of morality. The Yogis pretend to acquire all sorts of miraculous power by the practice of Yoga. The book is written in black and red, accompanied by an interlinear commentary, and comprising several magic calculations. It is on separate leaves about one foot and three inches long and two and a half inches broad. As the Hindu authority of the curious case of human "hibernation" mentioned by Dr. Honigberger, and witnessed by hundreds in the Panjab, it is very valuable. A translation accompanies it.

25. Details of a Persian MSS., containing 10 or 11 books of the beginning of the 15th century, written by order of Mirza Yáshgar, grandson of Tamerlane. It is written in miniature, but very legible, gold letters and is profusely interspersed with gorgeously illuminated "headings" and pictures.

It contains the Khamsa Nizami and the Khamsa Amîr Khosro (or the five books of Nizami and the five books of Amir Khosro). The details are as follows :—

A. *Nizámi* or *Nizam-ud-dín* was an inhabitant of Ganjah, now Elizabethopol near Tiflis. He wrote (in 582 of the Hejra) the—1. *Makhzan-i-Asrar* in honour of Bahram Shah Rûmi, for which the author received at the rate of 100*l.* a line (or verse?) and magnificent robes of honour. It treats of ethics, contains stories with their morals, and describes with great power, liberty, youth, and age. 2. *Shirín Khosro* (Khosro is a form of Kesar). Khosro possessed Shirìn, of whom his great rival Ferhad was enamoured. 3. *Haft Pekár.* Behrám was a king of Persia, surnamed Behram Gor, because he was fond of hunting the wild ass (Gorkhar). Both Nos. 2 and 3 were written in 593 A.H. in honour of Qizil Arslán. 4. *Leila Majnún* (the well-known story of the infatuated lovers), written in 592 A.H., dedicated to the Khakán Manu Chehr the Great (?). 3. The *Sikandar Namah,* (exploits of Alexander the Great), Nizami's last work, who died (597 A.H.) a few days after completing it. It is dedicated to Toghrul Shah Suhjuhi, and consists of two parts, "Barri" being Alexander's exploits by land, and "Bahri" his doings at sea. It also contains moral precepts. Nizami, unlike his contemporaries, shunned courts, and when the king Qizil Arslan went to pay him a visit, was found at the mouth of his cave on a mat, with his Korán, inkstand, and a long pen as his sole earthly possessions. Many tried to imitate his style and matter, *e.g.*, Jami, Faiz, Hafti, &c. &c., who produced Khamsas (or five books), but no one succeeded so well by the concurrent testimony of poets and scholars as,—

B. *Amir Khosro,* whose "Khamsa" consists of,—1. *Matla-ul-danwár,* which was written in contradiction of the Makhzan-i-asrar, the first book of Nizami. It contains 3,310 verses, and was finished in two weeks, in 698 A.H. 2. The story of *Shirín Khosro,* 698 A.H., contains 4,124 "poems." Khosro is the lover and Shirin the beloved. 3. *Leila wa Majnún,* 698 A.H., contains 2,360 verses. 4. *Ahyina Sakandari,* in opposition to the Sikandar nama of Nizami, and contains 7,372 verses. 5. *Hasht Behisht* was written in 701 A.H., and contains a reply to the "Haft Baikar" of Nizami. Amîr Khosro's original name was Ain-ud-din-abd-al-Hasan. He was born at Putiali in Eastern India. His father was a Turk of Shahr-i-Sabz, the birthplace of Tamerlane, and was a "Lachîni" chieftain, who came to India in the reign of Shams-ud-din Altamsh, owing to the invasion of Changêz Khan.

Princes were in the habit of having the Khamsas of Nizami and Khosro transcribed in gold letters, or in excellent handwriting on the best paper, and kept them always at hand. The first who did arrange them in this manner was Mirza Yáshgár, grandson of Tamerlane, and there is little doubt, from the splendid style in which this manuscript is got up, and from other evidence connected with it, that this is the very first, as it is the best, collection of the *Khamsas.*

The manuscript is bound in very good leather, and is then enclosed in another cover of Kemkhab (or purple worked with gold). It is then enclosed in three successive silk wrappers of red, blue, and green, wrought in gold; then covered with a white muslin, and finally enclosed in a satin cover put inside a linen handkerchief. The whole is then put in an iron or tin case. The arrangement above described of the wrappers was deemed essential to its preservation by its princely family of owners, who had kept it for centuries, and to whose ancestors it had been transmitted in Central Asia.

There are also other poems added by Amir Khosro, in which he describes liberty or absence from worldly pleasures. Many of the metaphors, &c. most renowned all over the East are the creations of this poet. Besides the above, he produced four Diwáns in Persian, comprising precepts and other subjects on —1. Tohfat-us-saghir (Childhood and its beauties). 2. Wast-ul-Hayat (the age from 7 to 14). 3. Ghurrt-ul-Kemál (the Perfection of Youth and Manhood). 4. Baqia wa Naqia (Old age). These Diwáns, which are said to pourtray his own life, contain 130,000 couplets. He also wrote the Ajaz Khosrawi, containing tropes, similes, &c., which is highly prized by Persians, Central Asiatics, and also natives of India. In the Naqad-ul-Fatah he describes the capture of Deogurh. The Masnawi Qurn-us-Sadain describes the interview between Kaikobad and his son. Another Masnawi has numerous stories. His "History of Delhi" treats it up to his own time. He also

wrote the Mesalat Hind, &c. &c. In all, he wrote about 99 works. He was the first who composed a "ghazal" in Hindi on the Persian rhythm, and has been followed by all who versify in Urdu. Before him all wrote in Persian, whilst the vernacular songs were on the Hindi system of prosody. Khosro was also a musician, and made some innovations in that science, whilst his simple style has made him popular, both among the educated and the uneducated. He has had hosts of more or less successful imitators. He served under seven different kings, but devoted himself chiefly to the works to which he owes his reputation. He died at the age of 74, in the year of the Hejra 725. His tomb still exists in the old town of Delhi, which is about three miles from the present city. Every year on the 17th of Shawál, a fair is held there in honour of Nizam-ud-din Awliá (his Pîr or patron saint).

GROUP XXVI.—EDUCATION, TEACHING, AND INSTRUCTION.

SECTION I.—PLANS, ORGANISATION, MEANS OF INSTRUCTION, AND PERFORMANCES OF NATIONAL SCHOOLS.

Bombay Committee.

Child's cradle.
Collection of toys.
English and native school books.
Caps (4). Woollen, silk embroidered, and silk and gold embroidered. From the Ahmednuggur girls' school.
Various articles of clothing, &c. worked and embroidered by pupils of the Dhoolia girls' school:—
Caps. Woollen, and silk embroidered.
Woollen comforters (2).
Female waistcoats, "cholees" (3).
Woollen stockings (2 pairs).
Silk handkerchief, with fine workmanship.
White handkerchief, with fine workmanship.
Pen-wiper, with silk and "pota" embroidery.
Inkstand cushion.
Ball, made of wool.
Specimens of needlework from the Hyderabad girls' school:—
Caps (2). Silk embroidered.
Head-dress. "Rawa."
Girl's shirt. "Paren." Embroidered.
Woollen slippers (3 pairs).
Money bag, with glass work.
Spice pouch, "chunchee." From the Bombay girls' school.
Specimens of needlework. From the Sind girls' school, and from the Rutnagherry girls' school.
Table ornament embroidered with "potu." From the Tannah girls' school.
Books, in Arabic-Sindhi character. From Bombay.
Books in the Marathi, Guzerathi, Hindustani, Sanskrit, and Persian languages. From Bombay.

Photographs of various Educational Institutions, as follows:—

Bombay Vernacular Girls' School, and schoolmistress.
A class in the Alexandra Native Girls' Institution.
A "mofussil," or up-country girls' school and "mistree," or schoolmistress.
A "mofussil," or up-country girls' school in Sind.
Vernacular school and "pantojee" (schoolmaster).

Bengal Committee.

A Hindu Baby's Bed, consisting of the following articles:—

A "lep" or "tosuk," a stuffed bedding of chintz.
A "balish," pillow.
A "balaposh," a covering quilt.
A "kántha," an under quilt.
A "shorisa-balish," or pillow stuffed with mustard seeds.
Two side pillows (pas-balish).
"Dolái," or covering sheet.
"Maduri" (a mat).

These form the bed for the baby; the whole being laid upon the "maduri," or mat. The pillow for the head stuffed with mustard seeds is used for babies only; the seeds being said to keep off cold from the child's head. Some stuff these pillows with silk from the pods of Calotropis gigantea.

Hindu Baby's Dress, consisting of:—

"Dhutis" (a pair).
Shoes "juta" (2 pairs).
Cap, "topi."
Shirt "jama."

These articles form the ordinary dress for a Hindu baby, they are never used till the baby is six months old.

A cradle, "Dolna" or "Hendla."—A cradle now out of use in the town and its vicinity. It is suspended from the ceiling of the room or the thatch of the hut. The bedding and the baby are placed in the bag-shaped net, and swung backwards and forwards.
An "angta" or fire pot.—A fire-pot is an indispensible article in a Hindu nursery. The milk is heated over it, and the baby is rubbed over with hands smeared with oil and warmed over the fire.
Brass cups (2), "bati."—These are cups in which milk for the baby is generally kept.
Baby's spoon, "jhinuk." — A jhinuk is a baby's spoon. It is an imitation in silver or brass of the shell of a bivalve mollusc (Unio marginalis, *Lamark*) common in the tanks of Bengal.
"Kájalnatá."—A "kájalnatá" is an iron pod-shaped implement somewhat like a double spoon, in which lamp black is collected and mixed with ghee. This ointment or collyrium is applied to the eyes of the baby.
A "chusi."—A chusi is generally made of wood lacquered over and painted in brilliant colours. It is given to the child before teething that the child may bite it when the gums are irritated. It serves the purpose of the piece of coral, or ivory ring, used in the English nursery.

Toys (2). Jhunjhunis.
A "bhanta."—A small ball, generally of sun-dried earth, used as a play ball by the children of the country.
A "ghunsi."—A piece of twisted silk or cotton thread (or, like the specimen sent, worsted braid) worn round the loins by almost all Hindus of all ages to wear keys upon. It is put round the child that a piece of iron, generally a key, may be attached to it; iron being supposed to keep off evil spirits from the person of the wearer.
A "maduli."—A maduli is a charm either attached to the ghunsi or to a string of silk hung from the neck or arms.
A "tágá."—Tágá is a piece of thread worn round the arm as the record of a vow to some idol.
"Basuta." — The untwisted thread used for the "taga."
Reed pens (4) - An inkpot ("dwat") - Palm leaves (talpat) - These articles form the "stationery" used by the children of the country for writing.
"Pánchan."—Pánchán is a collection of dry herbs (medicinal), the infusion of which is taken as a febrifuge, &c.
"Jhal."—A collection of pungent, astringent, and aromatic drugs pounded and made into balls.
"Pradipa."—Pradipa, an ordinary chirág or earthen lamp used in applying warm oil fomentation, called "shek," to babies.
"Ramkhari."—This is the chalk-stone (soap-stone) used by the Hindus as a writing pencil at the commencement of the education of the child, the floor of the room serving the purpose of a slate.
"Pinra."—A wooden board, upon which the baby is placed while bathing or basking in the sun.
"Noá."—Noá is a ring of iron worn on the wrist by babies as a protection against evil spirits. It is also an indispensable ornament for a wife. Indeed it is never thrown aside so long as the husband lives, and it is considered as the prolonger of the husband's life.
"Bhela."—Semecarpus anacardium, used as a child's medicine in dysentery.
"Antmorá."—Antmorá (Isora corylifolia) considered a specific in dysentery.
"Bherar dor."—Is a thread made of sheep's wool, to which is tied a cowry; worn round the ankle of a child as a protection from the "evil eye" of witches.
"Alui."—"Alui" is a ball made of several carminative simples.
A "Kauri-jhinuk."—"Kauri-jhinuk" or jhinuk-shell. "Jhinuk" is the native name of a bivalve shell (Unio marginalis, *Lamarck*) used instead of a knife to cut the umbilical cord when a child is born.
A "pathar bati" (stone cup).—Used for administering medicine.
A "Sindur Kauta" (vermilion box).—The vermilion is used for painting, on mother and child, the red spot at the junction of the forehead with the root of the nose. This mark is called the "teep," and in the case of a woman distinguishes a wife from a widow.
A "tiper bati" (marking cup).—Contains a crimson pigment made from "alta" (see next item); used for staining the lips, palms of the hands, and soles of the feet of women and children.
A bundle of "alta."—Thin layers of cotton wool steeped in cochineal dye or in dye obtained from "Bakam" wood (the tree from which the red powder used in the Holi festival is made).
The "Sisubodhak" ("boy's teacher").—A Bengali child's first reading book.

N.W. Provinces Local Committee.

Specimens of school work, as follows:—
Rugs (2) of wool.
Fans (2).
Baskets (6) of reed and silk.
Basket—containing a box, a purse, and a native backgammon board—of beads.
Specimens (31) of writing. Plain and ornamental.
Specimens of needle-work and hand-writing. By Christian girls in the Rev. H. Sterne's school, Goruckpore.
Specimen of oriental writing, and the reed with which it was written.
Bottle, with writing on the inner surface.
Maps (17).
Globes.

The following articles from the India Museum belong to the educational collection originally sent to the London Exhibition of 1871:—

Madras Local Committee.

2,538. Satin-wood book rest } from Madras.
2,539. Red-wood book rest - }
2,386. Collection of printed Tamil and Telugu text-books used in indigenous vernacular schools.

Tamil.

Hari Chuvadi (or primer)
Valamugan (moral verses).
Thivakuram (names of things).
Viveka Chintamani (moral instructive pieces).
Arithmetical or other tables.
Anthi Chuvadi (aphorisms of Anviar).
Ranga Kolambugam (sacred poetry).
Thiruvengada Mala (sacred poetry).
Thiruvarunga Gattan Wuthi (sacred poetry).
Thiruvengada Satha Kam (sacred poetry).

Telugu.

Balasitsha (large primer).
Sumathi Sutakam (moral verses).
Nithi Languraham (moral verses).
Ramayanam (schoolboy history of Rama).
Kuchela Uppakhganam (religious legend).

2,578. Collection of text-books in Telugu used in the Christian Vernacular Education Society's or other missionary schools, Madras.
2,587. Satchel used in indigenous vernacular schools.
2,589. Book-rest used in indigenous vernacular schools.
2,591. Collection of writing boards and writing materials used in indigenous vernacular schools.
2,592. Brass ink bottle used in indigenous vernacular schools.
2,596. Collection of Tamil letters written on Palmyra leaves.
2,595. Specimens of native drawing illustrative of punishments in indigenous vernacular schools, Madras.
2420. Writing by girls of the London Mission Schools, Madras.
2,598. Specimens of Persian and Hindustani writing and paper for writing, from Madras.

2,602–2,615. Specimens of school work as examples of result of teaching.

2,571. Collection of text-books in the Tamil language used in government schools.

2,572. Collection of Telugu books, illustrating the standard of study in the Telugu language in government schools in the Madras Presidency :—Acha Telugu Ramayanum. Jaimini Bharata. Baskars Ramayanum Balakandam. Udyogaparvam. Punchotantrum. Nalacharitram. Selections from Vemana. First book of lessons. Second ditto. Third ditto. Kasiyatra charitra. Brown's English Reader and Little Lexicon. Neti Sangraham. English and Telugu. Venkiah's grammar. Parsing and analysis. Seshiah's grammar. Manual of geography, part I. A short account of the Madras Presidency. Morris's History of India. Brief sketches of Europe. Brief sketches of Asia. Anglo-Telugu dictionary. Elements of Euclid, book I. Fowler's method. Copy slips. Large hand. Mounted.

2,574. Collection of Canarese books of the Educational Department, Madras, used in government schools :—Morris's History of England. Manual of geography. First book of lessons. Second ditto. Third ditto. Arithmetic, part I. A short grammar of the ancient dialect of the Canarese language. Canarese school grammar. First catechism of grammar.

2,575. Collection of vernacular text books to illustrate the standard of study in government schools for Mahomedans :—Masnavi Hussain. Akwan-u-suffa. Lalimama. Gilchrist's grammar. Mantha Kabur, or Persian third grammar. Kavoid Farsi. Gulistan. Pund nama. Karima. Hakarfath Latifa. Thasneefi Farsi. Tate's elementary mechanics.

2,576. Collection of English books used in mission schools, Madras :—First book of poetry in English. First book in English. Second ditto. Third ditto. Fourth ditto. Fifth ditto. Advanced reader. English primer, part I. Ditto, part II. Guide to spelling and pronunciation. The letter writer. Grammatical primer. Mrs. Handyside's History of India. Outlines of ancient history. Outlines of modern history. Outlines of geography. Geographical primer. Scripture geography. Catechism of geography. Arithmetical primer. First catechism. Second ditto. Scripture texts. Stories from the Old Testament. Ditto New ditto. Sheet alphabet. One set of English sheet lessons.

2,577. Collection of Tamil text books used in the Christian Vernacular Education Society and other Missionary schools:—Picture alphabet, English and Tamil. English and Tamil Vocabulary, part I. Ditto Ditto, part II. First book. Second book. Third book. Fourth book. Reading book for Zenana and advanced classes. Attisudi. Condrievendan. Vettiverki. Neethenarivillakam. Muthurie. Minor poets, book I. Ditto, book II. Ditto, text alone. Ditto, complete. Selections from the Cural. Pope's 1st and 2nd grammar. Geographical primer. Mrs. Handyside's History of India. Ancient history. Arithmetical tables. Arithmetical primer. Astronomy. First catechism. Second catechism. Old Testament stories. Questions in New Testament history. Hymns for children. Pictorial primer. Anglo-Tamil primer, part I. Ditto, part II. English and Tamil first book. One sheet alphabet. One set of sheet lessons.

2,579. Text-books illustrating the course of study in the Malayalam language followed in the German Missionary and other schools on the Malabar coast. Kurla Pirama :—One thousand Malayalam proverbs. The Pilgrim's Progress. Malayalam English translator. Malayalam school Panchatuntrum. Dr. Gundert's grammar, large. Elements of English grammar. Chronological digest of the English History of India. The reformation in Germany. Malayalam primer. Henry and his bearer. Clift's geography. Keralolpatti. A short account of the Madras presidency. Malayalam spelling and reading book. Arithmetic. Amerasem, English and Malayalam. Ditto, Malayalam. English and Malayalam dictionary. Malayalam and English dictionary. History of Mahomed. The Sermon on the Mount. Malayalam country and its geography. Adhya Ramayanvm. Uttara Ramayanum Kuratty Patt. Narayamyum. Nalacharitrum. Kristna Patt. Subbabranamam. Rama Kirna Mirtham. Lantana Gopalam. Kristnarjuna Vijiom. Kalliaya Sowgandegrum. Moogammy Mabathmyam.

2,580. Collection of Canarese text-books to illustrate the course of study in the Canarese language, followed in the German mission and other schools on the Malabar coast. Canarese poetical anthology. Æsop's fables. Arithmetical exercises, 1st book. Ditto, 2nd book. Ditto, 3rd book. Answers to arithmetical exercises, 3rd book. Description of Coorg. Outlines of geography. Geographical primer. Second catechism of Canarese grammar. First Canarese instructor. School Panchatuntrum. First Canarese and English translator. Coorg songs. Method of teaching arithmetic. Chronological digest of Indian history. Descripton of South Canara. Canarese primer. Outlines of history of India.

Educational Department, Bombay.

2,326. " Pati," writing board.

2,330. Satchel.

2,332. " Pati," writing board with figures on it.

2,350. Basket containing Mahomedan toys.

2,351. A school-boy's record from the Maratha country.

2,352. No information.

3,808. Collection of school exercises.

Bengal Local Committee.

1,999. An earthen inkstand - -
2,001. " Pital-ki-diwat," brass inkstand -
2,003. A copper inkstand - - -
2,041. " Kalamdan," a stand for ink and pens - - - - -

} From Bengal.

3,373. Specimens of ornamental Persian writing by native students of lower vernacular government schools.

3,372. Maps (not mounted), gurus of training schools.

2,034. Urdu " gazl," or song by an Urdu scholar in Dacca.

2,038. Maps and drawings by boys of aided Anglo-vernacular schools in the Dacca district.

2,039. Specimens of handwriting from memory and dictation, translation, and composition by boys and girls of aided schools in the Dacca district.

Rev. J. Long, Bengal.

2,000. A cocoanut globe.

Pundit Ram Jasur of Benares.

3,481. " Shri Sikhsha," a series of Hindi books for female schools.

H.H. the Maharajah of Bhurtpore.

3,607. Eight Oordoo books.
3,608. Eight Hindi books.

M. Kempson, Director of Public Instruction, N.W. Provinces.

3,550. Collection of English educational books, comprising:—Elementary principles of Dynamics, by J. Platts. India to the Bibliography of the Indian Philosophical systems, by Fitz-Edward Hall. Urdu-English Vocabulary. History of Hindustan, an English version of. Bábú Siva Grasad's work. Urdu-Hindi-English vocabulary.
3,055. Specimens of caligraphy.

M. Kempson, Government Normal School, Benares.

3,659. Map.
3,671. Map from Halgabandi School, Pipraich.

Rajah Jye Kishen Doss, C. S. I., Allyghur.

3,053. Specimens of caligraphy.

Rev. J. S. Johnson, Shahjehanpore.

3,054. Fifth annual report of the Mission Stations of the Methodist Episcopal Church.

Punjab Local Committee.

722. Wooden board for writing - -
723. Wooden boards do. - - } From
725. " Rhel," or reading-desk book (used by readers of the Koran) - - } Punjab.
744. Multiplication table - - } Punjab
750. Shopkeeper's account book - - } schools.
764. Leather portfolio, from Punjab.
753. Specimen of writing - -
754. Persian writing - - -
772. Specimen of handwriting - - } Punjab
773. Specimen of handwriting, lower school - - - - - } schools.
776. Persian alphabet - - -
726. " Pushtoo " caligraphy; language of the Afghans.
727. Specimens of writing with the finger-nail.
728. Arabic caligraphy.
729. Specimens of writing with the finger-nail in the Gurumkhi character.
730. Persian writing in large characters.
731. Gurumkhi caligraphy; Sikh character.
732. " Nagri " (Hindi) caligraphy.
733. Thread lines for writing paper.
734. Specimens of embossing on paper with the finger-nail.
735. Persian, Nagri, Gurumkhi, and Arabic caligraphy.
736. Arabic caligraphy.
737. Do. do.
738. Persian do.
740. Teachers Book.

Government Educational Press, Lahore.

743. The Persian Primer.
752. Map of the Eastern Hemisphere.
717. Map of the Jhung district.
721. Normal School, Umritsur. Map of the Punjab by Iman-ud-din.

Oudh Government.

1,379. Sun dial made by a vernacular schoolmaster - - - - - } Oudh.
1,775. Nishani, used to point out letters, &c. }
1,426. Chohe Namah. A book used in indigenous schools. It is a fabulous account of a rat and cat war.
1,761. Native writing box. This box contains every implement, and is furnished with a secret drawer. Oudh.
1,763. Zer Mushk. Used to support paper when any native seated on the ground writes in the usual fashion without a table; all the papers included in the zer-mushk are called " waslees," and are used as slates, as the writing can be washed out. Oudh.
1,764. Muktáh. Collection of letters to teach boys hand-writing. Oudh.
1,767. Wooden boards, plain, with glass shell for smoothing. These are the usual boards found in all schools from Ceylon to Peshawur; but in mercantile schools the boys write on brass plates with chalk. Oudh.
1,769. Book supporter used for religious books; may be used in four ways. Oudh.
1,770. Box containing different inks (dry), and two inkstands with chalk for beginners. Oudh.
1,772. Pounce-box found in all offices and schools. Oudh.
1,776. Bag used by school-boys to hold their books. Oudh.
1,441. Six alphabet sheets used as copies in government schools. Oudh.
1,381. Rehab book rest.
1,432F. Arabic primer used in indigenous schools.
1,380. Celestial globe used by Mahomedan students in astronomy. Oudh.
1,760. Various specimens of handwriting showing the result of indigenous education in Oudh.
1,765. Wooden board with Urdu writing. Wooden board with Nagri writing. Schoolboys go over the letters with a dry pen, and thus learn their shape. Oudh.
1,768. Lines for writing. The lines are not written over, but the paper is creased with them.
1,681–1,683. Drawings, maps, writing, translation from Persian, Euclid, and composition by pupils of the Lucknow Chowk School.
1,685. Map of Oudh by Vilayet Hossin - } Lucknow
Ornamental writing by Behari Lal - - - - } Chowk School.
1,689–1,695. Globe, maps, plain and ornamental writing by pupils of Mulhiabad Town vernacular school.
1,696–1,699. Maps and handwriting by pupils of Amethi Town School.
1,700–1,729. Specimens of writing, composition, &c., &c. by pupils in various schools in Oudh.
1,670–1,679. Specimens of writing, composition, &c., &c. by pupils in various schools in Oudh.
1,550–1,559. Specimens of writing, composition, &c., &c. by pupils in various schools in Oudh.
1,433. Curriculum of studies for village schools in Oudh (primary education). This curriculum is supplied to all village schools in Oudh.
1,434. Curriculum for vernacular, town, or Tehsil schools in Oudh (middle class education) supplied to all vernacular Tehsil schools.

1,435. Curriculum for Anglo-vernacular town schools, Oudh (middle class education), supplied to all Anglo-vernacular town schools.

Oudh Local Committee.

1,650–1,669. Drawing, maps, writing, &c., &c. by pupils in various schools in Oudh.
1,620–1,649. Drawing, maps, writing, &c., &c. by pupils in various schools in Oudh.

Head Master of the Normal School, Lucknow, Oudh.

1,375. Turya Yantra. This is an instrument used by native astronomers for obtaining angles of elevation; made from native pattern.
1,376. Raj Yantra. The original from which this instrument was copied was made by an astronomer in the service of the Maharajah Man Singh of Oudh. It is used to ascertain the altitude of heavenly bodies and the position of the sun in the heavens for latitudes 26° 51′ and 25° 56′, *i.e.*, for Lucknow secular capital and Ajoodhia religious capital.
1,377. (2,720/'71.) Maun Yantra. Equatorial, altitude, or azimuth instrument used by Hindu astronomers; made from native pattern.
1,378. (2,727/'71.) Celestial sphere made of cane, and used by Hindu astronomical schools; it is generally made from bamboo, and the various circles are named according to the slips attached, the names and conceived positions of these circles being thus acquired by native students. Oudh.

Babu Sital Pershad Gupt, schoolmaster, Oudh.

1,781. Model of a breast-wheel used to explain to boys the action of water-wheels.
1,780. Working model of steam engine } Made by
1,779. Model of locomotive engine - } B. S. P. G.
Used in Government schools to explain the action of the valves of a locomotive engine.

Munshi Nawul Kishore, Lucknow.

380. Two specimens of " " or holiday presents. These are given by indigenous schoolmasters to their pupils on holiday occasions; in return the teachers receive presents in cash or otherwise.
1,437. Lithographed map of Asia in Urdu.
1,438. Lithographed map of eastern hemisphere in Urdu and Hindi.
1,439. Lithographed map of western hemisphere in Urdu.
1,440. Lithographed map of India in Urdu.

Head Master of Oonao School, Oudh.

1,377. Pratod Yantra, or hour rod, is the instrument by which Hindu astronomers even of the present day measure their time. It consists of a rod whose horizontal section is a regular octagon, and the breadth of whose base is to the breadth of its top as 3 to 2. It is about 27 inches long, having near the top a groove on each of its sides to receive a stick attached to it, which is about 9 inches long. The length of the day varies from 26 to 33 dundas. *How to use the instrument* :—The length of the day being known, the last-mentioned stick is made to pass through the groove which is marked with this length. It is then made to stand perpendicular to the horizon, facing the sun, so that the shadow may fall on the side, which marks the length of the day. Before noon the shadows show the hours past, and after noon the remaining hours.
1,377. Dhanur Yantra is a semi-circular protractor.
1,377. Dhuva Yantra is an instrument to find the direction of the poles. It consists of a pointer whose length is equal to the radius of the circle through whose centre it passes at right angles. The circle is divided into 60 equal parts. It is so placed at noon that the shadow of the pointer may fall at the 45th part. Oudh.

Educational Department, Central Provinces.

999. Red painted board, with inkstand and reed pen.
1,001. Black board with liquid chalk and reed pen.
1,002. Palm leaf blank book with style to write with.
1,003. A bundle of Uriya books used in town and village schools.
1,006. A bundle of Marathi books.
1,027. Varnished kitha, with inkstand and reed pen from Nagpur.
1,028. Red painted board with inkstand and reed pen.

Mysore Local Committee.

1,963. Book made of cloth used in native schools for slates with a pencil. Mysore.

Burmah Local Committee.

2,072. Copy of " Praygyee." } From
2,073. Copy of " Mengala Thoot." } Burmah.
These are religious books in the Pali language from which the pupils are usually taught to read the Burmese characters. Like all the books they are written on palm leaves with an iron style. When the letters have been thus scratched on the leaf, earth oil is rubbed over the writing, which makes it distinct.
2,074. Speciman of " Parabaik " or school slate with pencils. This is the ordinary book of coarse paper in which pupils write exercises with the pencils, of which specimens are exhibited. Burmah.
2,078. A dress for a monk.
2,100. Drawing of the Virgin and Child by a boy. Burmah.

Sind Local Committee.

3,842. Writing board. } From Sind.
3,875. Three reading books, Arabic. Sindhi.
3,876. Four do. do.
3,885. Elements of arithmetic.
3,886. Outline of history.
3,877. First book. Hindu girls' school.
3,878. Second book. Sindhi girls' school.
3,879. Arithmetic. Hindi. Sindhi.
3,880. Arabic primer.

Berar Local Committee.

928. A globe made by Wamum Trimbah, school master, English Marathi School, Akolah, Berar.
916. Paraphrasing.
913, 917. Writing from dictation in English Marathi and Urdu.
918. Writing in Sanskrit.
919. Writing in Modi (Marathi current hand).
920. Writing in Urdu.
914. Translation from Sanskrit into English.
926. Map drawing in Marathi by pupils of the English Marathi School, Akolah.
923. Marathi writing (Devanagari character).
921. Marathi writing (modi or current hand).
925. Map drawing in Marathi.

924. Ornamental writing in Marathi by pupils of the Marathi Normal School, Akolah.
922. Penmanship, dictation, and original poetry in Urdu by pupils of the Hindustani Normal School, Akolah.
915. Marathi verses in praise of her Majesty and of the International Exhibition of 1871, by Naro Ragaunath, master of the Marathi Normal School, Akolah.

Hyderabad Local Committee.

3,900. Specimens of writing, &c. Sukkur Normal School.

SECTION II.—MIDDLE CLASS SCHOOLS.

Bombay Committee.

Photographs of various Educational Institutions, as follows:—

A high school class-room in Sind. Classes in the Elphinstone High School. The New Elphinstone High School. Elphinstone College. Deccan College, Poona. St. Xavier's College. St. Mary's Roman Catholic Institution. The Robert Money Institution.

The following articles from the India Museum belong to the Educational Collection originally sent to the London Exhibition of 1871 :—

Madras Committee.

2,567. Collection of text books in English to illustrate the standard of study in the 5th class of a Zillah School, Madras.—Selections in English Prose, Part I. Ditto Poetry, Part II. Sullivan's English Grammar. Morris's History of India. Duncan's Geography of India. Barnard Smith's Arithmetic. Phillips' Introductory Atlas.
2,566. Collection of text books in English to illustrate the standard of study for the 4th class of Zillah School, Madras.—Selections in English Poetry, Part I. Supplement to the 4th book of lessons (Irish series). Chambers' moral class book. Manual of Geography. Pott's Euclid, Book I.
2,568. Collection of text books to illustrate the standard of study for the 3rd class of a Zillah School, Madras.—1st Book of Reading in English and Telugu. 2nd Book of Reading in English and Tamil. 2nd Book of Reading in English. 1st Book of Lessons in Hindustani. 2nd Book of Reading in English and Hindustani. McLeod's 2nd Book of Lessons in English. Elementary English Grammar by Morgan. Short account of the Madras Presidency.
2,569. Collection of English text books to illustrate the standard of study for the 2nd class of a Zillah School, Madras.—A Manual of English Grammar. Third reader (in English) describing the products of Southern India, &c. &c.
2,570. Collection of text books to illustrate the standard of study for the 1st class of Zillah School, Madras.—1st Book of Reading in English. 1st ditto in English and Tamil. 2nd ditto in English and Telugu. Arithmetical tables.

Bombay Local Committee.

3,800. Bombay Sanskrit Series. Sanskrit Classics for the use of high schools and colleges. 6 fasciculi.

Principal of Government College, Agra.

3,056. Specimens of caligraphy.

Birjbullub Student of Bhurtpore College.

3,610. Map of India in Hindi-Persian.

Punjab Committee.

741. Scheme of Studies for Zillah Schools. Punjab.

Munshi Nawul Kishore, Oudh.

1,436. Curriculum for Anglo-Vernacular Zillah Schools, Oudh (higher class education), supplied to all Anglo-Vernacular Zillah or Country Schools in Oudh. Lithographed by M. N. K.

Mysore Local Committee.

1,960. Report on Public Instruction in Mysore, for the year 1869–70.
1,960. Report on the High School of Bangalore for for the year 1869.
1,965. Specimens of writing in English, Sanscrit, Canarese, Telugu, Tamil, Maharatti, Persian, and Hindustani, being a translation of Montgomery's poem of Home, written by boys in the High School, Bangalore.

Berar Local Committee.

927. Map drawing in English, Marathi and Urdu, by pupils of High School of Akolah, Berar.

Hyderabad Local Committee.

3,906. Specimens of exercises. High School, Hyderabad.

SECTION III.—TECHNICAL COLLEGES AND UNIVERSITIES.

Bombay Committee.

Photographs of Educational Institutions:—Sir Jamsetjee Jeejeebhoy School of Art. Grant Medical College. Poona Engineering College.
Bombay University calendar, from 1868–69 to 1872–73.
Matriculation examination papers of the University of Bombay.
Report on public instruction in the Bombay Presidency, from 1868–69 to 1871–72.

The following articles from the India Museum, London, belong to the educational collection originally sent to the London Exhibition of 1871 :—

Madras Local Committee.

2,565. Collection of text books to illustrate the standard of study for the matriculation examination of the Madras University.—Text book in the English language, containing select portions in Irving's Life of Columbus, Crabbs Village, &c.

Angus's Handbook of the English tongue. Morell's Analysis of Grammar. White's History of Great Britain and Ireland, or Morris's History of England. Cornwell's School Geography. Todhunter's Euclid. Colenso's Algebra, Part I. Cornwell's School Atlas.

2,582. Madras University Calendar for 1870–1.

2,563. Madras University text books in English, illustrating the standard required for the first examination in Arts.—Milton's Paradise Lost, Books I. & II. The Adelphi Press First Arts text book for December 1871. Thompson's Laws of Thought. Marshman's History of India, 3 Vols. Todhunter's Algebra. Pott's Euclid, complete. Phillips' Comprehensive Atlas.

2,563. Madras University text books, illustrating the standard required for the degree of a Bachelor of Arts (B.A.).—Arnold's Lectures on Modern History. Childe Harold's Pilgrimage. Bacon's Essays. Mill on Liberty. Sir Wm. Hamilton's Lectures, vols. I. & II. Hallam's Middle Ages, vols. I., II., & III. Student's Gibbon. Student's Hume. Parkington's Elementary Mechanics. Drew's Conic Sections. Main's Plane Astronomy. Todhunter's Plane Trigonometry.

Madras School of Industrial Arts.

1,646. Annual Report.

2,418. Drawings of architectural ornaments.

2,422. Drawing lessons.

2,423. Rudimentary drawing lessons.

Bombay Committee.

2,347. Bombay University Calendar and set of examination papers.

2,346. Examination papers of Engineering College, Poona.

3,791. Engineering drawings.

G. W. Terry, Sir Jamsetjee Jeejeebhoy School of Art Bombay.

A series of drawings from the Ambernath Temple.

1,940. General plan of Ambernath Temple and its environs.

1,941. Half ground plan, half ceiling.

1,942. Longitudinal section.

1,943. Transverse section.

1,944. Details.

1,945. Detail of north-west corner of Mandap M on plan.

1,946 to 1,951. Details.

1,952. Details of pilaster and verandah.

1,953. Detail of south-west pilaster, west porch.

1,954. Detail of doorway leading to Vimanah, J on plan.

1,955. Detail of recess.

These drawings were made from measurements taken on the spot by students of the Sir Jamsetjee Jeejeebhoy School of Art. They should be considered as the result of the teaching in the Architectural Class in the School of Art.

A series of decorative architectural panels in oil-colours and water-colours by pupils of the School of Art.

Capt. A. M. Lang, R.E.

4,307. Indian engineering papers, published quarterly in English, at Seharunpore (from the Exhibition of 1872).

Thomason Civil Engineering College.

4,308. Calendar.

Lieut. F. Firebrace, R.E.

4,309. Professional papers on surveying. Roorkee College, Seharunpore.

Hyderabad Local Committee.

3,869, 3,870. Plans of buildings, Hyderabad Engineering School.

SECTION IV.—AUXILIARY MEANS FOR THE IMPROVEMENT OF ADULTS.

Bombay Committee.

Catalogue of manuscripts from Guzerath. From Bombay.

Bombay Sanskrit series.

Specimens of Modi and Pehlvi literature.

N.W. Provinces Local Committee.

Astronomical and other instruments, as follows :—

"Bhittiyantra." A mural quadrant.
"Yantra-sumrat" (the prince of instruments).
"Chakra-gantra."
"Digansa-yantra."
"Chakra." Circle.
"Chassa." Semicircle.
"Turiya." Quadrant.
"Phalaka-yantra." Vertical circle.
Equinoctial circle.
Slate sun-dial.
Gnomon.

Scientific works :—

Bibliotheca Indica (2 copies).
The Memmandira Observatory.
The Siddhanta Sirnioni.

A series of 256 vernacular educational works, published by the N.W. Provinces Government Press.

Dr. Leitner, Lahore.

Illuminated addresses in Urdu, &c. Specimens of newspapers started and books published by Dr. Leitner in the Punjab, and other specimens of his educational and other works. Maps of the Punjab, the Frontier, Turkistan, &c. Specimens of native handwriting and toe-writing. Specimens of native printing in various languages, &c.

Madras Local Committee.

1,592/72. Specimens of Canarese and Malayalum types from South Canara.

2,596. Collection of Tamil letters written on Palmyra leaves.

2,599. Specimens of superior printing, binding, &c., executed in Madras.

2,581. Popular vernacular reading books to illustrate the efforts made by the Madras School Book and Vernacular Literature Society to provide instruc-

tion and amusing vernacular works for private reading.

Tamil.

Robinson Crusoe.
Life of George Stephenson.
Steam and the Steam Engine.
Lamb's Tales from Shakespeare: Hamlet; The Merchant of Venice.
Fine Arts.
Undine.

Telugu.

Life of George Stephenson.
Moral Tales or Stories, English and Telugu.
A Selection of Telugu Proverbs.

Hindustani.

Hindustani Proverbs.
Sketches of Native Life and Character in Southern India.

2,601. Tamil song book, describing the various uses of the plantain and palmyra trees.
2,597. Collection of native newspapers and educational journal to illustrate the progress of native newspapers and educational journal in the Madras Presidency.

Abdus Sarnat, Madras.

2,556. Illuminated Persian caligraphic writing.

John Murdock, Madras.

Catalogue of the Christian vernacular literature of India.
2,584. Classified catalogue of Tamil printed books.

Government of Bombay.

3,800. Travels in England, by Karsandas Mulji, in Guzerathi.
A treatise on Materia Medica, by Náráyon Dáji, in Marathi.
A Dictionary of Sanscrit Roots, in Sanscrit and Marathi, by Vishnu Parashurám, Shástrí Pandit.
An old Zend-Pahlavi Glossary, by Destur Hoshengje Tamaspje, high priest of the Parsis in Malva, India, edited by Martin Haug, Ph.D.

Educational Department, Bombay.

3,792. Time Tables.
3,792. Puranic Map of the World. This map gives the mythological geography of the world according to ancient Hindu traditions. The relative positions of towns and rivers in India are laid down with some degree of accuracy, the seven bands round India are the seven oceans encircling as many lands in insular continents, the seas being salt water, sugar-cane juice, wine, clarified butter, curds, milk, and fresh water. The seven continents, Jamba, Plaksha, Sálmali, Kúsa, Kraencha, Sáka, Pashkasa. Cf. Vishnu Puráná, translated by H. H. Wilson, 1840. Book II., chap. II.
3,801. Collection of Anglo-vernacular and vernacular newspapers.

Bengal Local Committee.

1,990. Arabic manuscript, by an Arabic scholar in Dacca.
2,029. Persian MS. of James Khirudnameh-i-Sikanderi.
2,037. Eulogies to H.M. the Queen in Sanscrit verse, by Pundits of the Sanscrit toles in the Dacca district.
2,048. Universe according to the Hindoos, by Jagatbandhu Tarkabagish, Pundit of a Sanscrit tole at Dacca.
3,371. Specimen of ancient caligraphy on palm leaves, a century old.
3,374. Map of North America.
3,965/'72. A Bengali caligraphic caprice.
3,966/'72. Sanscrit and vernacular books and pamphlet printed in Bengal.
3,969/'72. Hindu talismanic writing on Sanchi bark, called generically "Yantras" or "Kavachas."
4,876/'72. A Mahomedan Tavis, or talismanic writing.
4,883/'72. Nine pages copied from a Bengali MS. astrological book, showing the curious forms of tables (called "Chakras," literally, "wheels"), used for astrological calculations.
1,098. Universal sun-dial, made by Mangrun, native student and citizen of Patna.
3,950/'72. A collection of newspapers and books printed in Bengal.

Baboo Romanath Tagore, Bengal.

3,377. Alphabets of all the languages in use in India, exhibited on a sheet folding into a book.

Ram Chunder Chuckerbutty Brothers, Calcutta.

4,887. A book of specimens of lithography.

Local Committee, North-west Provinces.

4,274/'72. The Pioneer daily newspaper.

Principal, St. John's College, Agra.

3,058. Original composition in Sanscrit, and translations from Arabic.

M. Kempson, Director Public Instruction, North-west Provinces.

3,472. Sanscrit and English dictionary, by Pandit Rányasan.
3,473. Trilingual dictionary.

Ahmad Khan, Bahadur.

3,477. One copy of Social Reformer, edited by exhibitor.

Syad Ahmad Khan, Bahadur.

3,485. Essays on the life of Mohamed, by exhibitor.

H.H. the Maharajah of Benares.

3,548. Armillary sphere.
3,549. Sidhanta Siramoni.
3,553. Model instrument of Mān Māndir in Benares.
3,554. Pamphlet describing the instrument of Mān Māndir.
3,555. Gnomon.
3,556. Gnomon.
3,557. Chakra or circle.
3,559. Phalaka Yantra.
3,560. Quadrant.
3,561. Semicircle.

H.H. the Maharajah of Bhurtpore.

3,609. Map of England in Hindee, lithographed at Bhurtpore.

Sheik Baicha.

4,321/'72. Imsal Tukhmeena Imarat in Urdoo on estimating, published at Seharunpore by exhibitor.

Moonshee Sadhasookh Lall.

4,276/'72. Aina-Ilm, monthly Urdoo newspaper, published at Allahabad by exhibitor.
4,277/'72. Birtant-Durpun, monthly Hindee newspaper, published at Allahabad by exhibitor.
4,278/'72. Moulum-ul-Kawanun, in Urdoo, on law, published monthly at Allahabad by exhibitor.

Rev. J. J. Walsh.

4,282/'72. Makhzan-i-Masihi, or the Christian Treasury, monthly magazine in Roman charcaters, published at Allahabad by exhibitor.

Moonshee Gunga, Pershad.

4,317/'72. Gunjeena-i-Ulloom, weekly Urdoo periodical, published at Moradabad by exhibitor.
4,320/'72. Mai Juntree San, 1871 (Urdoo Civil List), published yearly in Urdoo at Moradabad by exhibitor.

Moonshee Pyaray Lall.

4,322/'72. Mungul Samachar Putr, monthly Urdoo newspaper, published at Baiswan by exhibitor.

Shiam Suroop.

4,319/'72. Mukhgun-ul-Ulloom, Bareilly fortnightly Urdoo periodical, published at Bareilly by exhibitor.

Punjab Local Committee.

769/'72. Three books printed at Lahore.
868. Pamphlet on Lahore pottery.
745. Huma-i-Punjab, the Punjab Phœnix in Urdoo, published by the "Anjuman-i-Punjab," or Punjab Society for Promoting Useful Knowledge.
746. "Koh-i-noor," or mountain of light.
747. "Paise-ka-Akhbar," the farthing journal (costs three-eighths of a penny).
748. Atalik-i-Punjab, an educational journal.
4,283/'72. Delhi Gazette, daily newspaper.

Government Educational Press, Lahore.

717. Map of the Jhung District.

Baboo Nobin Chunder Roy.

751. Hindi grammar. Sanscrit grammar. Dialogues on morality, &c., Part I. Ditto geography and meteorology, Part II. Reprint of correspondence on Brahminism in Hindee. Hindee primer. Punjabi first reading book. Book of tales in Punjabi. Elementary grammar of the Punjabi language. Description of natural objects and modern inventions. Book of songs, poems, and hymns in Punjabi. The tale of Ramayana, a description of the ceremonies attendant on the bestowal of cows on Brahmins (Sanscrit). Hindu religious formula (Sanscrit). Tale of Nala and Damayanti (Sanscrit). Work on astrology (Sanscrit). Urdoo almanac for 1871. Poem on the loves of Radha and Krishna. Ditto ditto, in Nagri.

Government of Oudh.

377/'72. Two specimens of Arazdasht. Superfine arwali adorned with gold leaves, the sides richly embroidered; used by the higher gentry to write petitions to princes upon. The one with the nymphs upholding a crown was invented by the Ex-king of Delhi.
379. "Lowh-i-Kitali." This is a specimen of paper used by the gentry of Lucknow to write manuscripts upon. The first or little page is adorned with gold, and the sides of the first few pages are embroidered with gold and silver flowers.
1,387. Alphabet book, said to have been written by the Emperor Shah Jehan, whose seal it bears.
1,390. Dewan-i-Hafi, a very scarce book.
1,391. Dewan-i-Hafiz. These are the celebrated poems of Hafiz, the mystical poet of Shiraz.
1,392. Tarikh-i-Kashmir, a very scarce book.
1,393. Khálay Bari, a vocabulary in verse.
1,399. Shah Namah. This book was written by Fardasi, the friend of Akbar. It is a history of the Kings of Persia.
1,400. Akbar Namah, 3 vols. History of Akbar written by Abul Fazl, the friend of Akbar.
1,401. Ain Akbari, 3 vols. The laws and regulations of Akbar, being a history of his empire written by Abul Fazl.
1,409. Account of the conquest of Syria in Urdoo, translated from the Arabic, to show the kind of literature now current amongst the Urdoo speaking population of India.
1,415. Mukhizun-ul-Tajarat, being a translation with maps of a report of the trade and resources of the country bordering on the north-western boundary of Hindustan.
1,416. Translation of Oliphant's Narrative of Lord Elgin's Expedition to China, in Urdoo.
1,417. Accounts of the mutiny, in Urdoo.
1,418. Amrit Sagar, a Hindu treatise on medicine.
1,419. Malijat Ahsami, a treatise on medicine.
1,420. Malumat-ul-Afay, containing fictitious wonders of the world still believed to exist by the uneducated.
1,421. Ajaib-ul-Muklugat, a very popular natural history, in Persian.
1,422. Collection of native almanacks from 1766 to 1865.
1,423. Translation of the Mahabharut, the great Hindu (in Urdoo verse).
1,424. Alf-i-Leila, 4 vols. Arabian Nights. Specimens of modern Urdoo verse.
1,427. Euclid, 15 books in Arabic MS.
1,428. Akhbar Sarishtah Talim for 1869–70, Educational Gazette.
1,429. Mahur Chintaman, a work on astrology.
1,430. Shighr Bodh. Ditto.
1,791. Proceedings of the Lucknow Reform Club.
1,792. Ditto. Seetapoor. Ditto.

Munshi Newul Kishore, Lucknow.

373 '72. Specimen of "Gagazi Nokah," or dower deeds. This is superior Arwali adorned with gold, it is used by the rich to write dower deeds upon. The blank spaces at the sides are for the signatures of witnesses. Made by the exhibitor.
388/'72. Two specimen books of lithography in gold and colours. These are specimens of lithography of the seven different characters used in Persian. It has a page for the "Diva Nagri" also. Each page is lithographed as many times as there are different colours in it. The lithographing in gold is quite a new invention.

Bani Pershad's Press, Lucknow.

1,432. An almanack.

Educational Department, Central Provinces.

998. Palm leaf book of Stokes, in Telugu.
1,026. Bundle of country paper, wooden board with pen and chalk.
1,029. Palm leaf book of Ganapati Stotra in Tamil.

Local Committee, Mysore.

1,959. English and Canarese Dictionary, by John Garrett.
The Arnnodaya, an illustrated Anglo-Canarese Magazine, edited by Rev. B. Rice, London Mission, Bangalore. Canarese Dialogues on Revenue and Judicial Matters, police courts, public works, agriculture, &c. &c., with a liberal interlinear translation.
1,964. Newspaper.

Indore Local Committee.

1,756/'72. "Malwa Akbar." Lithographed by the Indore Press.

Educational Department, Sind.

3,871. Essay on female education.
3,874. Sind Sudhar, a bi-monthly periodical (the first periodical published in the vernacular of the province), published under the direction of the Educational Department in 1870–71, 600 subscribers.
3,881. Dictionary, English and Sindi.
3,882. Rai Diach Arabic.
3,883. Suswn Purha Poem.
3,887. Kamsen Kamrup Arabic.
3,888. Stories, Hindi, Sindi.

PHOTOGRAPHS AND DRAWINGS REFERRING TO THE EDUCATIONAL COLLECTION FORWARDED FROM INDIA TO THE LONDON INTERNATIONAL EXHIBITION OF 1871.

[20 FRAMES.]

No. of Frame.

SCHOOLS OF ART IN INDIA.

Madras School of Industrial Art.

1. Patterns drawn on the ground in front of the houses of natives.

Calcutta School of Art.

2, 3, 4. Specimens of drawing, engraving, and lithography, by students of the school.

Madras School of Industrial Art.

5. Copper-plate engravings.

SCHOOL BUILDINGS IN INDIA.

Madras Local Committee.

6. Photographs of Harris School, Madras. Government High School, Bangalore. The Presidency College, Madras.

Bombay Local Committee.

7. Photographs of Raj Koomar's College, Kattyawar. Belgaum School Building. Training College, Ahmedabad.
8. Photographs of Civil Engineering College, Poona. Deccan College. Money School, Bombay.
9. Views of Elphinstone College, Bombay. Students of Elphinstone College, Bombay.

MODES OF PUNISHMENT USED IN NATIVE SCHOOLS IN INDIA.

Educational Department, Mysore.

10. Water-colour sketches of the modes of punishment used in the indigenous schools of Mysore.

SCHOOLS OF ART IN INDIA.

Madras Local Committee.

11. Photograph showing students learning brick-making.

Bombay Local Committee.

Photographs of Architectural Sculpture Department, Bombay. Lecture Room, School of Art, Bombay. Students and Staff of the School of Art, Bombay.

No. of Frame.

BURMESE MONASTERIES.

Rangoon Local Committee.

12. Photographs of Budhists' Monasteries, Mandelay. Budhists' Monasteries, Rangoon. Monastic School, Rangoon. Group of Burmese Monks. One of the entrances to Shive Pagoda, Rangoon. Grand entrance to Shive Pagoda, Rangoon.

SCHOOLS OF ART IN INDIA.

Madras School of Industrial Art.

13. Drawings of indigenous and exotic varieties of cotton grown in Western India.

NATIVE MODES OF GYMNASTIC EXERCISES.

Oude Local Committee.

14. Water-colour drawings of native gymnastic exercises.

GROUPS OF SCHOLARS AND TEACHERS FROM VARIOUS PARTS OF INDIA.

15. A boy learning to read. A boy's posture whilst writing. A boy going to school. A Memshi and his pupils, Agra. A Sanskrit school. A vernacular school, Madras. Female convict school. A village school, Oude. Hindee girls' class, Oude. A village school. A native muktub, Oude. Kolata standing. Kolata sitting. Gymnastic exercises, Ahmedabad.

SCHOOLS, BUILDINGS, AND GROUPS OF SCHOLARS FROM VARIOUS PARTS OF INDIA.

16. The Talookdar's School, Ahmedabad. A village school in Sydapett, Madras. Government Normal School, French, Ahmedabad. Government Female Normal School, Nagpoor. Joy Narain's College. Lord Napier's School, Madras.

GROUPS OF SCHOLARS AND TEACHERS FROM VARIOUS PARTS OF INDIA.

17. A girls' school, Bombay. A village school, Bengal. Group of students.

No. of Frame.

MODES OF PUNISHMENT USED IN NATIVE SCHOOLS IN INDIA.

Bengal Local Committee.

18. Photographs illustrating the modes of punishment formerly in use in the indigenous schools of Bengal.

Thomason Civil Engineering College Press, Roorkee, N.W. Provinces.

19, 20. Sketch maps of the Gujranwallah District, executed for the Punjab Government.

1,767. No. 5. Showing the irrigated condition, productive capacity, and cost of wells in different parts of the district.

1. Broad coloured lines show limits of fiscal zones.
2. Thin coloured lines show limits of tax circles.
3. Curved dotted lines denote depth of water in wells below the surface of the earth.
4. Straight dotted lines represent nuddees or streams.
6. Black dottd lines show the old pergunnah division.

1,768. No. 6. Showing the different kinds of soils and irrigated classification of cultivated area.

Red coloured lines show the limits of Tehseel division.

No. of Frame.

Coloured tracts indicate the "Chaklas" or circles of taxation.

The figures are intended to give, 1st, the main denominations of soil expressed in area and per-centage; 2nd, the locally known distinctions expressed in per-centage.

The per-centages are calculated on the total cultivated area.

1,769. No. 10. Shades in colour showing degrees of fertility indicate "Chuklas" or circle of taxation.

The figures are intended to give, 1st, the rates which have been adopted for deducing a plough and well estimate; 2nd, the rates fixed upon after many trials and after comparison with the rates on similar land in other districts as best adapted for the new revenue demand.

The soils here taken are the main denominations which have been described in map No. 5.

The table contains the results after applying these rates, together with the amount proposed to be fixed as the revised rates.

1,770. No. 16. Showing the locality of Rukhs or Government grass preserves.

Lithographs (7) executed for the "Roorkee Professional Papers on Indian Engineering," by Lieut. Firebrace and Capt. Lang.

LIST OF AWARDS.

Name.	Description.	Award.

GROUP I.—MINING, QUARRYING, AND METALLURGY.

Dr. Oldham, Superintendent of Geological Survey of India.	General collection - -	Diploma of Honour.

GROUP II.—AGRICULTURE, HORTICULTURE, AND FORESTRY.

Dr. Geo. Bidie, Madras - - - -	Grains - - -	Medal of Merit.
Do. do. - - - -	Forest products - -	Honourable Mention.
Secretary, Local Committee, Burmah - -	Grains - - -	Do. do.
Do. do. Central Provinces -	Do. - - -	Do. do.
Do. do. Amritsar - -	Materia medica - -	Medal of Merit.
Do. do. N.W. Provinces -	Dye stuffs - - -	Honourable Mention.
Do. do. do. - -	Grains - - -	Do. do.
Do. do. do. - -	Forest products - -	Do. do.
Do. do. Berar - -	Grains - - -	Do. do.
Do. do. Indore - -	Do. - - -	Do. do.
Do. do. Oude - -	Do. - - -	Do. do.
Do. do. Madras - -	Do. - - -	Do. do.
Do. do. Mysore - -	Woods - - -	Medal of Merit.
Do. do. do. - -	Coffee - - -	Honourable Mention.
Do. do. Bengal - -	Grains, oil seeds, and tobacco	Medal of Merit.
Do. do. Bombay - -	Grains, oil seeds, tobacco, and dye stuffs.	Do. do.
Do. do. do. - -	Coffee from Aden - -	Honourable Mention.
Do. do. Punjaub - -	Grains and dye stuffs -	Do. do.
Mysore Coffee Company - - - -	Coffee - - -	Do. do.
Superintendent, Gun Carriage Factory, Madras -	Woods - - -	Do. do.
V. Fretwell, Khandeish - - - -	Grains and oil seeds - -	Do. do.
Government of Bombay - - - -	Grains - - -	Medal of Merit.
Government of India - - - -	General Collection - -	Do. do.
H.H. the Guickwar of Baroda - - -	Oil seeds, &c. - -	Honourable Mention.
Conservator of Forests, Central Provinces - -	Woods and gums - -	Medal of Merit.
Do. do. Berar - - -	Woods - - -	Honourable Mention.
Do. do. Oude - - -	Do. - - -	Do. do.
Deputy Conservator of Forests, Salem, Madras -	Woods, gums, and dyes -	Medal of Merit.
Dr. Kanny Loll Dey, Calcutta - - -	Materia medica - -	Honourable Mention.
H.H. the Maharajah of Benares - - -	Grains - - -	Medal of Merit.
Superintendent of Central Museum, Madras -	Woods - - -	Do. do.
Dr. M. C. Cooke, India Museum, London -	Fibres, materia medica, &c. -	Do. do.
Colonel Puckle, Mysore - - - -	Woods - - -	Honourable Mention.
W. Sarson, Chittagong - - - -	Coffee - - -	Medal of Merit.
Capt. R. N. Taylor, Coorg - - - -	Do. - - -	Do. do.
W. Theobald, Burmah - - - -	Woods - - -	Do. do.
India Museum, London - - - -	Food grains - - -	Do. do.

GROUP III.—CHEMICAL INDUSTRY.

Dr. Kanny Loll Dey, Calcutta - - -	Materia medica - -	Medal for Merit.
Secretary, Committee of Central India, Nagpore -	Essences - - -	Honourable Mention.
Commissary of Ordnance, Cawnpore - -	Glue - - - -	Do. do.
Secretary, Local Committee, Amritsar - -	Chemical products and dyes -	Do. do.
Do. do. Berar - - -	Indigo - - -	Do. do.
Do. do. Bombay - -	Salt and soda - -	Medal for Merit.
Do. do. Punjab - -	Essences and dyes - -	Honourable Mention.
Jardine, Skinner, and Co., Mirzapore - -	Shell lac - - -	Do. do.
India Museum, London - - - -	Materia medica - -	Medal for Merit.
F. Moore, Do. do. - - - -	Animal fats and other animal products.	Medal for Progress.
Dr. Geo. Bidie, Madras - - - -	Materia medica - -	Medal for Merit.
Schöne, Kilburn, and Co., Calcutta - -	Shell lac - - -	Honourable Mention.

Name.	Description.	Award.
GROUP IV.—SUBSTANCES OF FOOD AS PRODUCTS OF INDUSTRY.		
Binny and Co., Madras	Sugar	Honourable Mention.
E. G. Brace, Kotergherry	Tea	Do. do.
Campbell and Co., Dindigal, Madras	Cigars	Do. do.
Carew and Co., Shahjehanpore	Sugar	Do. do.
Commissioner of Kumaon	Tea	Medal for Merit.
Secretary, Local Committee, Amritsar	Sugar	Honourable Mention.
Do. do. Indore	Spirits	Do. do.
Superintendent, Curzon Estate, Kotergherry	Tea	Medal for Merit.
Framjee Nowrajee, Bombay	Pickles and preserves	Honourable Mention.
C. Havelock, Ootacamund	Tea	Medal for Merit.
Roberts and Co., Coconada, Madras	Cigars	Honourable Mention.
Sapoorjee Framjee Wyeed, Kurachee	Pickles and preserves	Medal for Merit.
Sett Atmaram Pretumdas and Co., Sinde	Spirits	Honourable Mention.
P. Vencatachellum, Madras	Pickles and preserves	Medal for Merit.
GROUP V.—TEXTILE INDUSTRY AND CLOTHING.		
Ahmad Shah and Ahsam Shah, Loodiana	Rampore chuddas	Medal for Merit.
Baboo Balgobind Khuttree, Benares	Silk and gold embroideries	Do. do.
Baboo Sridur Sai, Zemindar of Mangha, Sarum	Gold embroidered belt	Medal for Good Taste.
Superintendent of Central Jail, Bangalore	Fibres	Medal for Merit.
Do. do. do.	Woollens and carpets	Honourable Mention.
Hon. R. Bourke, London	Collection of embroideries	Medal for Merit.
H.H. the Rao of Cutch	Fibres	Do. do.
Secretary, Central Committee, Calcutta	-	Medal for Progress.
Chamba Mal, Amritsar	-	Do. do.
Government of India	Silks, &c.	Honourable Mention.
Secretary, Local Committee, Indore	Woollens and carpets	Medal for Merit.
Do. do. do.	Cotton fabrics	Honourable Mention.
Do. do. Madras	Cotton shawls	Medal for Merit.
Do. do. do.	Shawls	Do. do.
Do. do. do.	Silks	Honourable Mention.
Do. do. Berar	Cotton	Do. do.
Do. do. do.	Cotton fabrics	Medal for Progress.
Do. do. Oude	Do.	Honourable Mention.
Do. do. do.	-	Do. do.
Do. do. do.	Embroidered shoes, &c.	Medal for Merit.
Do. do. Bengal	Cotton cloths	Do. do.
Do. do. do.	Silk	Honourable Mention.
Do. do. Bombay	Cotton cloths	Medal for Merit.
Do. do. do.	Gold and silver embroideries	Do. do.
Do. do. do.	Turbans and caps	Do. do.
Do. do. Punjab	Silks, &c.	Do. do.
Do. do. do.	Cottons from Loodiana	Honourable Mention.
Do. do. Mysore	Silks	Do. do.
Do. do. N.W. Provinces	Cotton fabrics	Do. do.
Secretary, Sub-Committee of Surat	Cottons	Do. do.
M. David, Serajgunge	Jute	Medal for Merit.
Conservator of Forests, Central Provinces	Fibres	Honourable Mention.
Superintendent, Central Jail, Surat	Towels	Do. do.
Do. do. Lahore	Hearth rug	Do. do.
Government of Bombay	Silver embroidery	Medal for Merit.
Do. do.	Gold embroidery	Medal for Progress.
Gregory and Co., London	Carpets	Honourable Mention.
H.H. the Guickwar of Baroda	Embroidery	Medal for Merit.
W. G. McIvor, Ootacamund	Cinchona	Honourable Mention.
Lapworth Brothers, London	Carpets	Do. do.
Dr. Leitner, Lahore	Clothing	Medal for Merit.
Devisahai and Chambamal, Amritsar	Rampore, chuddas, and chogas	Medal for Progress.
H.H. Merr Ali Moorad Khan, Khyrpoor	Fabrics	Honourable Mention.
Farmer and Rogers, London	Cotton carpets	Do. do.
Do. do.	Woollen carpets	Medal for Merit.
India Museum, London	Woollen fabrics	Do. do.
Do. do.	Cotton fabrics	Medal for Progress.
Museum, Lahore	Gold and silver table cloth	Medal for Merit.

Name.	Description.	Award.
GROUP V.—TEXTILE INDUSTRY AND CLOTHING—continued.		
Rahim of Jallandar	Fabrics	Honourable Mention.
H.H. the Rao of Cutch	Embroidered table cloths	Do. do.
Vincent Robinson, London	Carpets	Do. do.
Collector of Benares	Cotton fabrics	Medal for Merit.
A. Streenevassa Rao, Tanjore	Silks	Honourable Mention.
H.H. the Thakoor of Bhownuggur	Indian saddle	Medal for Good Taste.
The Bhopawur Pul Agency	Fabrics	Honourable Mention.
H.H. the First Prince of Travancore	Fibres	Medal for Progress.
Watson, Bontor, and Co., London	Carpets	Honourable Mention.
GROUP VI.—LEATHER AND INDIA-RUBBER INDUSTRY.		
Colonel Michael, Madras	Skins of tiger, bear, and leopard	Honourable Mention.
Commissary of Ordnance, Cawnpore	Saddlery leather	Do. do.
GROUP VII.—METAL INDUSTRY.		
Allen and Co., Madras	Jewellery and silver filagree	Honourable Mention.
Arnachellum Achary, Salem	Cutlery	Medal for Merit.
Secretary, Local Committee, Punjab	Koftgari work	Medal for Good Taste.
Do. do. do.	Gold and silver industry	Do. do.
Do. do. N.W. Provinces	Gold and silver work	Honourable Mention.
Do. do. Amritsar	Silver industry	Medal for Merit.
Do. do. Mysore	Drinking vessels	Honourable Mention.
Do. do. Oude	Gold and silver jewellery and stores.	Do. do.
Do. do. Monghyr	Knives	Medal for Merit.
Do. do. Bengal	Peasant ornaments	Honourable Mention.
Do. do. Bombay	Metal industry	Medal for Merit.
Do. do. Madras	Jewellery and metal work	Do. do.
Ghulam Ahmad, Jammu	Jewellery	Medal for Good Taste.
School of Art, Madras	Metal industry	Medal for Merit.
H.H. the Maharaja of Benares	Peasant drinking vessels	Honourable Mention.
H.H. Meer Ali Morad	Silver work and drinking vessels.	Do. do.
Dr. Oldham, Calcutta	Metal work	Do. do.
A Native Employée of Messrs. Orr and Sons, Madras.	Silver fruit spoons	Do. do.
Mrs. Rivett-Carnac	Peasant jewellery	Do. do.
Ruthanum, Trichinopoly	Jewellery	Medal for Merit.
Vithelengum do.	Do.	Honourable Mention.
Watson and Co., Bombay	Gold and silver jewellery	Do. do.
Edwin Ward, London	Sporting trophies set as jewellery.	Do. do.
GROUP VIII.—WOOD INDUSTRY.		
Deschamps and Co., Madras	Table and wardrobe	Honourable Mention.
GROUP IX.—STONE, EARTHENWARE, AND GLASS INDUSTRY.		
Cabil and Yarroo, Hyderabad, Sind	Pottery	Honourable Mention.
Secretary, Local Committee, N.W. Provinces	Collection of pottery	Do. do.
Do. do. do.	Onyx and jasper knife handles	Do. do.
Do. do. Lahore	Stoneware	Medal for Merit.
Compaddy, N. Arcot, Madras	Pottery	Honourable Mention.
Ghulam Ahmed, Punjab	Stoneware	Do. do.
Dr. Hunter, School of Arts, Madras	Casts	Medal for Merit.
Joomo, son of Oosman, Sind	Pottery	Honourable Mention.
H. G. Keene, Agra	Carved and inlaid stonework	Medal for Merit.
Dr. Leitner, Lahore	Antique and modern stonework.	Do. do.
Peeranoo, son of Joomo, Sind	Pottery and materials	Honourable Mention.
Ruttoo Wullud Mengho, Hyderabad, Sind	Do. do.	Do. do.
Saboo, Nussurpore, Sind	Do. do.	Do. do.

Name.	Description.	Award.
GROUP X.—SMALL WARE AND FANCY GOODS.		
Bowany Hurryvalubh, Kurachee	Lacquered wood work	Honourable Mention.
Bowany Shunker Hurryvalubh, Bombay	Do. do.	Do. do.
Cowasjee Munchurjee, Bombay	Boxes and pen trays	Do. do.
Secretary, Local Committee, Bengal	Articles in ivory	Medal for Merit.
Do. do. N.W. Provinces	Fancy articles	Honourable Mention.
Do. do. Madras	Sandal and ivory articles from Vizagapatam.	Medal for Merit.
Do. do. do.	Collective exhibition of fancy articles.	Do. do.
Do. do. Mysore	Fancy articles	Honourable Mention.
Do. do. Bombay	Models of animals	Medal for Merit.
H.H. the Guickwar of Baroda	Figures of animals in ivory, wood, &c.	Do. do.
Colonel Michael, Madras	Sporting trophies	Honourable Mention.
Seshia, Tahsildar of Nursapore	Models of natives of India	Do. do.
Rustomjee Cowasjee, Bombay	Fancy articles	Medal for Merit.
H.H. the First Prince of Travancore	Ivory carvings	Do. do.
Edwin Ward, London	Fancy articles and sporting trophies.	Medal for Good Taste
Jamshetjee Shapoorjee, Bombay	Fancy articles	Medal for Merit.
GROUP XI.—PAPER INDUSTRY AND STATIONERY.		
India Museum, London	Collection of paper and materials.	Medal for Merit.
GROUP XVI.—THE ART OF WAR.		
Commissary of Ordnance, Cawnpore	Army saddlery	Medal for Merit.
GROUP XVII.—NAVY.		
Secretary of Local Committee, Bengal	Models of boats	Honourable Mention.
Do. do. Madras	Do.	Do. do.
GROUP XVIII.—CIVIL ENGINEERING, PUBLIC WORKS, AND ARCHITECTURE.		
India Museum, London	Photographs of bridges, &c. of East Indian railway.	Honourable Mention.
Civil Engineering College, Madras	Models of sluices, &c.	Medal for Merit.
GROUP XXIII.—ART APPLIED TO RELIGION.		
Secretary, Local Committee, Bengal	Carved stone images of idols	Medal for Merit.
Do. do. do.	Lamps and utensils	Medal for Good Taste
Do. do. do.	Paintings of Hindoo mythology.	Honourable Mention.
GROUP XXVI.—EDUCATION, TEACHING, AND INSTRUCTION.		
Dr. Leitner, Lahore	- - - -	Diploma of Honour.
Secretary, Local Committee, Bombay	Specimens of school work and school books,	Honourable Mention.
Do. do. Bengal	Do. do.	Do. do.
Do. do. Madras	Do. do.	Do. do.
Do. do. N.W. Provinces	Do. do.	Do. do.
Do. do. Oude	Do. do.	Do. do.
Do. do. Punjab	Do. do.	Do. do.
For a Map of the Himalayas	- - - -	Medal for Merit.
For a Geological Map of the Salt Range	- - - -	Honourable Mention.
Thomason Engineering College, Roorkee	For Educational Works	Do. do.

VIENNA UNIVERSAL EXHIBITION.

CLASSIFICATION AND DIVISIONS.

GROUP I.—MINING, QUARRYING, AND METALLURGY.

SECTION 1.—MINING :—

a. Mineral fuels.
b. Mineral ores and metals (except iron).
c. Other minerals.
d. Mining appliances and works.

SECTION 2.—IRON WORKS :—

a. Iron ores.
b. Processes for smelting, &c., and crude iron.

SECTION 3.—OTHER KINDS OF METALLURGY :—

a. Pure metals.
b. Alloys.

GROUP II.—AGRICULTURE, HORTICULTURE, AND FORESTRY.

SECTION 1.—AGRICULTURE :—

a. Grains and pulse.
b. Coffee.
c. Spices.
d. Narcotics.
e. Oil seeds.

SECTION 2.—ANIMAL PRODUCTS :—

a. Silk cocoons.
b. Wool and hair.
c. Skins, feathers, &c.
d. Horn, ivory, tortoiseshell.
e. Lac and miscellanies.
f. Manures.

SECTION 3.—FORESTRY :—

a. Timber and ornamental woods.
b. Tanning barks and dye woods.
c. Gums and resins.
d. Fruits and seeds.

SECTION 4.—HORTICULTURE :—

a. Vine culture.
b. Fruit culture.
c. Vegetables.
d. Practical and theoretical horticulture.

GROUP III.—CHEMICAL INDUSTRY.

SECTION 1.—CHEMICAL PRODUCTS FOR TECHNICAL PURPOSES.

SECTION 2.—PHARMACEUTICAL PREPARATIONS, ETHEREAL OILS, PERFUMERIES, DRUGS, AND OTHER RAW PRODUCTS FOR PHARMACY AND CHEMICAL INDUSTRY :—

a. Pharmaceutical preparations.
b. Ethereal oils and perfumeries.
c. Drugs and other raw products of pharmacy.
d. Raw products for chemical industry.

SECTION 3.—FAT INDUSTRY :—

a. Vegetable and animal fats and oils.
b. Products of fat.

SECTION 4.—PRODUCTS OF DRY DISTILLATION :—
- *a.* Refined petroleum and similar substances.
- *b.* Manufactures and derivatives therefrom.

SECTION 5.—EXPLOSIVE MATERIALS, DYE STUFFS, VARNISHES, AND OTHER PRODUCTS OF CHEMICAL INDUSTRY :—
- *a.* Explosive materials.
- *b.* Dye stuffs, mineral and organic.
- *c.* Varnishes, shell lac, sealing wax, &c.
- *d.* Other chemical products.

GROUP IV.—SUBSTANCES OF FOOD AS PRODUCTS OF INDUSTRY.

SECTION 1.—FLOUR AND OTHER FARINACEOUS PRODUCTS :—

SECTION 2.—SUGAR, CONFECTIONERY AND CHOCOLATE :—
- *a.* Sugar and molasses.
- *b.* Confectionery.
- *c.* Sweet preserves and jellies.
- *d.* Tea, cocoa, and chocolate.

SECTION 3.—WINE AND ITS SUBSTITUTES, BEER AND OTHER FERMENTED LIQUORS, AND VINEGAR.
- *a.* Wine of all kinds.
- *b.* Beer and other fermented liquors and vinegar.
- *c.* Spirits and cordials.

SECTION 4.—PRESERVES, EXTRACTS, AND MEATS :—
- *a.* Extracts of meat, soups, condensed milk, &c.
- *b.* Preserved meat, fish, &c.
- *c.* Preserved vegetables.
- *d.* Pickles and sauces.

SECTION 5.—TOBACCO AND SIMILAR MANUFACTURES :—
- *a.* Cigars and snuff.
- *b.* Products of hemp, &c.
- *c.* Opium.

GROUP V.—TEXTILE INDUSTRY AND CLOTHING.

SECTION 1.—WOOL AND WOOLLEN FABRICS :—
- *a.* Washed wool and hair, carded wool and worsted, combed wool and yarns.
- *b.* Carpets, blankets, and other fabrics.
- *c.* Mixed fabrics, including shawls.

SECTION 2.—COTTON AND COTTON FABRICS :—
- *a.* Cleaned cotton, yarns, twists, &c.
- *b.* Cotton fabrics.
- *c.* Mixed fabrics, chiefly cotton.

SECTION 3.—HEMP AND LINEN FABRICS, &C. :—
- *a.* Hemp, flax, and other fibres.
- *b.* Yarns, twine, ropes, cordage.
- *c.* Woven fabrics of linen, jute, &c.
- *d.* Straw and its fabrics, bonnets, &c., reeds, canes, bass, &c.

SECTION 4.—SILK AND SILK FABRICS :—
- *a.* Silk and silk thread, spun silk, and silk waste.
- *b.* Silk fabrics.
- *c.* Mixed fabrics in which silk predominates.

Section 4.—Bookbinder's, Portefolio, and Papier Mâché Goods:—
a. Bookbinding and similar work.
b. Papier mâché goods.

GROUP XII.—GRAPHIC ARTS AND INDUSTRIAL DRAWING.

Section 1.—Book, Copper, Steel-plate, and Music Printing, Lithography, Chromography:—
a. Letter-press printing.
b. Copper and steel-plate and music printing.
c. Lithography and chromography.

Section 2.—Engraving and Guilloche Work, Xylography:—
a. Wood engraving.
b. Copper and steel plate engraving.
c. Xylography, graphotypy, &c.

Section 3.—Photography.

Section 4.—Pattern Drawing and Paintings for Decoration.

GROUP XIII.—GENERAL MACHINERY.

Section 1.—Prime Movers, Machines for transmitting Power, parts of Machinery:—
a. Prime movers, steam engines, water wheels, &c.
b. Machines for transmitting power, shafts, wheels, pulleys, bands, &c.
c. Parts of machinery.

Section 2.—Machines for working Special Kinds of Material (excepting Agricultural).

Section 3.—Means of Transport and other Plant for Railways.

Section 4.—Street Locomotives and other kinds of Transport.

GROUP XIIIa.—AGRICULTURAL MACHINERY.

Section 1.—Agricultural Implements of all kinds.

Section 2.—Drawings and Models of Objects used in Agriculture, Horticulture, and Forestry.

GROUP XIV.—PHILOSOPHICAL AND SURGICAL INSTRUMENTS.

Section 1.—Mathematical, Astronomical, and Physical Instruments; Chemical Apparatus:—
a. Mathematical instruments.
b. Optical instruments, telescopes, microscopes, and astronomical apparatus.
c. Instruments and apparatus for physical science.
d. Telegraphic instruments and apparatus.
e. Chemical apparatus.

Section 2.—Clocks and Watches, and their Parts.

Section 3.—Surgical Instruments, &c.:—
a. Surgical instruments of all kinds.
b. Surgical apparatus, artificial limbs, teeth, &c.

GROUP XV.—MUSICAL INSTRUMENTS.

SECTION 1.—KEYED INSTRUMENTS, AS PIANOS, ORGANS, HARMONIUMS, &c.

SECTION 2.—STRINGED INSTRUMENTS, AS HARPS, GUITARS, VIOLINS.

SECTION 3.—WIND INSTRUMENTS, MUSICAL BOXES, AND OTHER MUSICAL INSTRUMENTS OF ALL KINDS.

GROUP XVI.—THE ART OF WAR.

SECTION 1.—EQUIPMENT OF TROOPS.

SECTION 2.—GENERAL ARMAMENT; ARTILLERY AND MILITARY ENGINEERING.

SECTION 3.—SANITARY ARRANGEMENTS.

SECTION 4.—MILITARY EDUCATION AND INSTRUCTION; CARTOGRAPHY AND HISTORIOGRAPHY.

GROUP XVII.—THE NAVY.

SECTION 1.—NAVAL ARCHITECTURE AND EQUIPMENT:—

a. Models and drawings of boats for lake and river navigation.
b. Models and drawings of sea-going ships, coasting vessels, merchant ships, and ships of war.
c. Stores and fittings for equipment, outfit, and armament of ships.

SECTION 2.—STRUCTURES FOR NAVIGATIONS; HYDROGRAPHY:—

a. Land and water works for navigation, models and drawings of docks, harbours, sluices, floating docks, floating batteries, and coast defences.
b. Hydrography, charts, &c.

GROUP XVIII.—CIVIL ENGINEERING, PUBLIC WORKS, AND ARCHITECTURE.

SECTION 1.—ABOVE-GROUND BUILDING:—

a. Building materials, processes, &c. for quarrying, brick making, girder work, preparation and preservation of wood, artificial stone, &c.
b. Plans, models, and drawings of public buildings, dwelling-houses, barracks, penitentiaries, prisons, hospitals, schools, theatres, labourers' cottages, apparatus for lifting and moving heavy weights in buildings, as lifts, &c., plans and models of cheap dwelling-houses, tools and implements of artisan builders.
c. Apparatus and inventions for health, comfort, and convenience in buildings (for lighting, water supply, drainage, waterclosets, lightning conductors, &c.).
d. Agricultural engineering; plans for culture, fencing, draining; farm buildings, buildings for cattle breeding; stores, stables, manure tanks, &c.
e. Industrial buildings, spinning mills, weaving mills, grinding mills, distilleries, breweries, sugar manufactories, warehouses, sawmills, docks, &c.

SECTION 2.—HYDRAULIC ARCHITECTURE:—

a. Materials and appliances for foundations (pile drivers, screw piles, coffer-dams, caissons, pneumatic and diving apparatus).
b. Hydraulic engineering works (excluding sea works), river works, canal works, dikes, locks, dams, &c.
c. Models and plans of viaducts, bridges, and aqueducts.

SECTION 3.—MAKING OF ROADS AND CONSTRUCTION OF RAILWAYS:—

a. Contrivances and tools for earthworks, excavators, dredging machines, apparatus for raising, carrying, and transporting earth and materials.
b. Materials and apparatus used for roads and railways, as road rollers, railway superstructure, switches, crossings, turn-tables, traversing-tables, inclined planes, lifts, pneumatic and other modes of propelling water stations and their apparatus, railway station buildings of all kinds, and systems of railway signals.

GROUP XIX.—THE PRIVATE DWELLING HOUSE, ITS INNER ARRANGEMENT AND DECORATION.

a. Models, drawings, and finished buildings representing dwelling-houses of civilised nations.
b. Drawings, models, and examples of thoroughly-furnished apartments.

GROUP XX.—THE FARM HOUSE, ITS ARRANGEMENTS, FURNITURE, AND UTENSILS.

a. Finished buildings, models, and drawings of farm houses of the different nations of the world.
b. Drawings, models, and examples of peasant rooms, furnished and fitted out with their furniture and apparatus.

GROUP XXI.—NATIONAL DOMESTIC INDUSTRY.

a. Pottery and porcelain of domestic manufacture.
b. Fabrics, tapestry, embroidery, lace, and other needlework.
c. Metal articles and ornaments.
d. Carved work and utensils.

GROUP XXII. EXHIBITION SHOWING THE ORGANISATION AND INFLUENCE OF MUSEUMS OF FINE ART AS APPLIED TO INDUSTRY.

a. Representations of the various methods and means by which the different modern museums endeavour to carry out the improvement of the general taste of the people, and the manner in which they promote the art, industry, and public instruction of their countries.
b. Exhibition of the objects which have been produced and propagated by these modern museums.

GROUP XXIII.—ART APPLIED TO RELIGION.

a. Decoration of churches, such as wall decoration, stained glass, gl painting, &c.
b. Church furniture, as altars, organs, pulpits, pews, shrines for enclosing sacı vessels, &c.
c. Ornaments for altars, pulpits, crucifixes, chalices, liburiums, candlesticks, al hangings and carpets, pulpit hangings, &c.
d. Objects used in baptism, funerals, &c.

GROUP XXIV.—OBJECTS OF FINE ARTS OF THE PAST, EXHIBITED AMATEURS AND OWNERS OF COLLECTIONS.

SECTION 1.—PAINTINGS OF ANCIENT MASTERS.

SECTION 3.—ART OBJECTS. BRONZES, ENAMELS, MINIATURES, MAJOLICAS, PORCEL FAÏENCE, &c.

GROUP XXV.—FINE ARTS OF THE PRESENT TIME, WORKS PRODUCED SIN THE SECOND LONDON EXHIBITION OF 1862.

SECTION 1.—ARCHITECTURE, INCLUDING MODELS, DESIGNS, SKETCHES AND SURVEYS ARCHITECTURAL WORKS OF THE PRESENT TIME.

SECTION 2.—SCULPTURE, INCLUDING FIGURES AND GROUPS OF SMALL SIZES, ENGRAV MEDALS, &c.

SECTION 3.—PAINTING, INCLUDING MINIATURE AND ENAMELS.

SECTION 4.—DRAWING AND THE GRAPHIC ARTS, INCLUDING COPPER AND STEEL ENGRAVINGS, ETCHINGS, WOODCUTS, &c.

GROUP XXVI.—EDUCATION, TEACHING, AND INSTRUCTION.

SECTION 1.—PLANS, ORGANISATION, MEANS OF INSTRUCTION, AND PERFORMANCES OF NATIONAL SCHOOLS :—

a. School houses and school apparatus, models, drawings, cradles, nurseries, child-gardens, games and amusements, and gymnastics.

b. School books and methods of instruction, including the instruction of the blind, deaf, and dumb, and idiots.

c. School work; results of teaching.

SECTION 2.—MIDDLE CLASS SCHOOLS, COMPREHENDING GYMNASIUMS, "REALSCHULEN," OR SCHOOLS WHEREIN EXACT SCIENCE AND MODERN LANGUAGES ARE TAUGHT.

SECTION 3.—TECHNICAL COLLEGES AND UNIVERSITIES.

SECTION 4.—AUXILIARY MEANS FOR THE IMPROVEMENT OF ADULTS: THROUGH LITERATURE, THE PUBLIC PRESS, PUBLIC LIBRARIES, EDUCATIONAL SOCIETIES, AND ASSOCIATIONS FOR INSTRUCTION.

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